Agriculture Dept.
Madras
Report on the operations
1886-87; 1887-88; 1889-90
1890-91 to 1896-97; 1898-99
1899-1900 & 1900-1901

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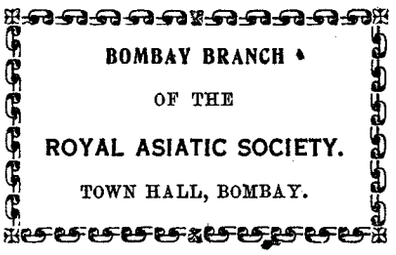

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REPORT

ON THE

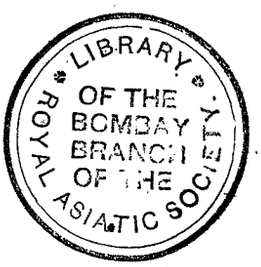
OPERATIONS OF THE AGRICULTURAL DEPARTMENT,

MADRAS PRESIDENCY,

134071.

FOR THE OFFICIAL YEAR

1886-87.



MADRAS:
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1888.

PROCEEDINGS OF THE BOARD OF REVENUE

(REVENUE SETTLEMENT, LAND RECORDS AND AGRICULTURE).

READ—the following G.O., dated 25th October 1887, Nos. 1012, 1012 A, Revenue :—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 1st September 1887, No. 310 :—

Resolution—dated 1st September 1887, No. 310.

The Board resolve to submit their report on the operations of the Agricultural Department for the past official year 1886-87.

2. There were several changes in the *personnel* of the department. Mr. Glenny was Acting Director of Revenue Settlement and Agriculture from the beginning of the year up to 26th July 1886, when he was relieved by Mr. Price, who was, however, on special duty throughout the month of September, drawing up a note as to the necessity of furthering the extension of protective railways for the Finance Committee. During this period, Mr. Grose, Acting Third Member of the Board of Revenue, was in charge of the Director's office. On the 1st October, Mr. Price resumed charge, but left the department on the 21st idem, on his appointment as Acting Secretary to Government in the Revenue Department. For about three weeks, Mr. Whiteside, Third Member of the Board of Revenue, was in charge. From the 16th November to the end of the year, Mr. Grose held charge for some time as Acting Third Member of the Board of Revenue, and subsequently as Acting Director of Revenue Settlement and Agriculture.

3. The principal events of the year are noticed fully in the accompanying reports of the Assistant Commissioner of Land Records and Agriculture and of the Inspector of Cattle Diseases.

I.—ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

4. The village records, with the exception, perhaps, of the register of agricultural stock, are, on the whole, fairly well kept, and the Board see no ground for the opinion, more than once hazarded by the Assistant Commissioner, that they are not worth the paper on which they are written. Referring to crop statistics, Mr. Benson states that these are "now not checked in the field and not tabulated in any definite form." The Board observe that, in his report for the preceding year, Mr. Benson himself admitted that "with certain reservations" the cropping return "will give us some general ideas not far from the truth." Full instructions for the preparation of these and other returns have been issued by the Board of Revenue from time to time, and they have now been embodied in the revised manual of accounts. With respect to the record of irrigation, Mr. Benson also admits that it is "now fairly complete," but he thinks that it is "altogether wanting as regards subterraneous supply." The existing accounts are not intended to show wells, ponds, &c., which are used solely for drinking purposes, but they contain accurate records of all subterranean sources which are used for purposes of irrigation.

5. The revised manual of accounts has been introduced in the current year. Its introduction last year was unfortunately delayed owing partly to the time consumed in translation into the vernaculars and partly to the necessity for a reference to the Controller-General regarding certain changes introduced by the manual, which involved an alteration in the form of treasury account.

6. One very important change effected by the new manual is the simplification of the village cash accounts. Under the old system every payment made by each proprietor was apportioned between ryotwar, quit-rent and other numerous items of miscellaneous revenue and land and village cesses. The distribution entailed enormous

labor on the village accountants and was unnecessary, as the object aimed at could be secured by a more simple process. The collections will, in future, be lumped under one head, to be called "Land Revenue and cesses," and eventually distributed between the several heads when the irrecoverable arrears are disposed of at the end of the year. In other words, instead of distributing the collections as received, or daily and even hourly, the irrecoverable arrears, which are small, will be distributed with reference to the demand of the several items payable by each individual, so that by deducting the irrecoverable arrears from the demand which will be determined in detail as at present, the collections for the year can be easily ascertained for such items as it may be deemed necessary to record separately in the accounts. Pending final adjustments between the several heads of revenue which cannot be effected before the following year, the requirements of the cesses will be met by a provisional credit to them to the extent, say, of about 95 per cent. of their demand.

7. The change above described will, it is expected, very considerably reduce the work of the village accountants and thereby enable them to devote more attention to the correct preparation of the other returns. At present, as a body, they are very heavily overworked, and it is no wonder that mistakes are occasionally made which would otherwise be avoided.

8. The agency for the supervision of the village record is at present numerically weak and is inadequately remunerated. Proposals for increasing the number and pay of the revenue inspectors have been under the consideration of Government for several years and are now in a fair way of being carried out.

9. In paragraph 11 of the Director's report for 1885-86, it was stated that a Survey test had been laid down for the revenue inspectors. From April next no persons will be appointed as revenue inspectors and no persons now holding that appointment will be promoted to higher grades, unless they pass the Revenue test Lower Grade and the prescribed Survey test. The number of Revenue Inspectors who have passed in survey that are now employed in the several districts is as follows:—

Ganjam	...	...	5
Godávari	...	...	6
Nellore	...	...	10
Bellary	...	...	17
Kurnool	...	...	11
Chingleput	...	...	14
North Arcot	...	...	8
South Arcot	...	...	16
Tinnevelly	...	...	4
Coimbatore	...	...	16
Nilgiris	...	...	1
Salem ...	...	...	8
South Canara	...	...	1
Total	...		117

10. An elementary test will shortly be prescribed for all appointments to the post of village officers, and patwaries or curnams will also be examined in surveying and the village manual.

II.—Analysis of Districts with reference to security from Famine.

11. Mr. Benson and his inspectors have completed the examination of the Kurnool district and have divided it into agricultural tracts with reference to soil, rainfall, &c. It remains now to tabulate the statistics for these tracts and to compile the analysis. The Government of India are, however, of opinion that the tract-plan, on which the work has been carried out, is too elaborate, and that it should be abandoned, the analysis being done through the agency of the ordinary revenue establishments and according to the existing administrative divisions. It is intended, however, that the analysis of the Kurnool district, on which much time and money have been spent, should be completed according to the tract-plan. The tractwar-lists have been printed since the close of the year and forwarded to the Collector with forms for the tabulation of the statistics.

III.—System of collection of Revenue and Rental in precarious Tracts.

12. The question of kistbandi or land-revenue instalments, referred to in paragraph 18 of the last report, was finally disposed of by Government in November 1886. It has been decided that there shall not be

G.O., dated 24th November 1886, No. 1033.

more than four kists in each district and that no kist shall be fixed earlier than December or later than May. As the same instalments may not be found suitable for a whole district, Collectors have been authorized to propose separate kists for groups of taluks or even for a single taluk if necessary, the main object to be borne in mind being that the cultivator should be allowed sufficient time to reap his produce and sell it to the best advantage before he is called on to pay any portion of the Government demand.

IV.—Measures of protection.

13. *Fodder and Fuel Reserves.*—There were 1,628 square miles of reserved forests and 6,733 square miles of reserved lands in the Presidency on the 31st March 1886. During the year under report, 684 square miles of forests were constituted reserved forests and 760 square miles were made reserved lands.

14. *Reclamation of Sandy Waste.*—Nothing has been done either by the Forest or the Salt Department in the direction of finding indigenous salt-bush plants in the different parts of the Presidency.

15. *Edible Cactus.*—Plants of the Maltese *edible cactus* were distributed last year for experiment to the marginally-noted districts. The plants are reported to be thriving everywhere except in Salem, Madras and South Arcot. In the first-named district, on account of a change in the *personnel* of the District Forest-officer, the plants were neglected and no trace of them is now to be found. In the other two districts, only a few of the plants are thriving.

1. Nellore.
2. Cuddapah.
3. Anantapur.
4. Bellary.
5. Kurnool.
6. North Arcot.
7. Chinglepet.
8. South Arcot.
9. Tanjore.
10. Tinnevelly.
11. Salem.
12. Malabar.
13. Madras.

16. *Diversified cropping.*—The lands reported to be available in the Kistna and Godávari districts for experiments in this direction were inspected by an agricultural inspector, and one block was reported to be fit for the purpose, but having regard to the expense likely to be incurred and to the probability that no commensurate results would follow, and seeing also that Mr. Benson's services were required for other more important work, the Government decided that the experiment should be abandoned for the present.

17. *Communications.*—It was expected that the portion of the Bellary-Kistna State Railway from Guntakal to Nandyál, a distance of 90 miles, would be open for public traffic by the end of the year, but was not. It has, however, been opened from the 11th July 1887. A railway from Tirupati in the North Arcot to Nellore has been completed, but has not been opened to traffic yet. A line from Bezváda to the Nizam's frontier is under construction and when completed will connect the Singareni coal fields with the Bellary-Kistna State Railway and the cannal systems of this Presidency. There are several other lines under survey which when taken up and completed will serve to protect the country from the effects of famine. No irrigation projects were sanctioned or completed during the year under report.

18. *Minor Irrigation Works.*—The year's allotment for the upkeep of minor irrigation works was Rs. 2,75,000. The actual expenditure was Rs. 2,60,000, or nearly 95 per cent.

19. *Agricultural Advances.*—The amount of loans granted under the Land Improvement Loans Act was Rs. 7,472 and that of advances under the Agriculturists' Loans Act was Rs. 17,225, total Rs. 24,697. The bulk of the advances was made in Ganjam (Rs. 12,358), Anantapur (Rs. 4,767), and Kurnool (Rs. 3,321).

20. *Native Arts and Manufactures.*—Mr. Havell, the Superintendent of the School of Arts, visited all important seats of arts and industries in the Cuddapah, Kurnool, Bellary, and Anantapur districts towards the close of the year, and submitted a report which has been published recently. As regards cotton-weaving, he found that a considerable industry is being carried on in colored cloths for female wear in the Bellary and Anantapur districts, and that fine white cloths of superior quality and well woven and having brocaded ends are made at Pullampet in the Cuddapah district. The cotton carpets made of country thread at Cumbum were well designed and good

in color, though rather coarsely woven. At Bellary, there was one family making carpets, the design and execution of which are good. There were over 300 families employed in carpet making at Adóni and Kurnool, but the best carpets are spoilt by the glaring colors of the European thread used by them. Carpets of large size are made to order and when native dyes are used the colors are said to be "pleasing and fairly permanent." Silk cloths are made in some places in the Kurnool, Bellary and Anantapur districts, chiefly at Dharmavaram in Anantapur and Kampli in Bellary. The patterns are good, but the effect is generally spoilt by the use of crude imported green, purple or yellow. The more harmonious country green and yellow dyes are rarely used, except when specially ordered. The industry, however, is in a very depressed condition. In wood-carving, there are a few good workmen at Adóni and Kampli. In design the Adóni carving is much the best, but the Kampli workmen are rather better carvers. Very fine lacquer-work is done by two families, on trays, fans, boxes, &c., at Nandyál and Banganapalle in the Kurnool district. Mr. Havell thinks that it is equal, if not superior, to any other Indian lacquer, and adds :—"This is a very effective and comparatively inexpensive form of decoration, which, if brought into notice and skilfully adapted to furniture and interior decoration, might become popular." The Nossum lacquer-work in the same district is similar in style, but much inferior both in design and execution.

V.—Agricultural Experiments including Farms.

21. The only Government farm, which was the one at Saidápet, having been closed in September 1885, Government have now no direct connection with any farm.

22. *Private Farms.*—The condition of the Madura and Karúr farms is noticed in detail in Mr. Benson's report, which is appended to these Proceedings. Mr. Benson considers that the Madura farm was not well managed during the year, but having regard to the very unfavorable character of the season and the difficulties with which the managers had to contend, the Board think that the management of the farm cannot be considered to have been altogether unsatisfactory. Several interesting experiments were conducted at this farm in shade-drying tobacco, and the feeding of dairy cattle and demonstrations of the Beheea sugar mills and other improved implements were also held at some of the principal festivals. The Karúr farm was inspected by Mr. Benson in June 1886 and appeared to be making progress, and the condition of the stock kept on the farm was fairly good.

23. *Exhibitions of Ploughs, &c.*—Until recently it was attempted to encourage the introduction of improved agricultural implements by ploughing matches and plough-trials. In the year under report, however, it was decided to conduct a sort of travelling show in the South Arcot, Tanjore, Trichinopoly, Madura and Tinnevelly districts. A show party accordingly started in the month of July 1886 under the supervision of Mr. Benson, assisted by Mr. Sami Iyengar (a student of the Agricultural College, who did excellent work in this direction in the preceding year), and visited several of the important towns and villages in these districts, where they exhibited selected implements at work before large crowds of people. The results of the show were so satisfactory (about 300 ploughs having been sold by Messrs. Massey and Co. during the two months the show lasted) that Government directed that similar travelling shows should in future be held systematically and that ploughing matches and plough-trials should be given up. Arrangements have accordingly been made for a show to be held in the current year in the Coimbatore, Salem, North Arcot, and the Ceded districts.

24. In this connection Mr. Benson apprehends that the real difficulty in arranging for making such shows permanent is, in obtaining a suitable person to put in charge of them. Considering the success which attended the unaided efforts of Mr. Sami Iyengar in Tinnevelly, while he was yet a student of the Agricultural College, the Board think there ought to be difficulty in training some of the agricultural inspectors, now working under Mr. Benson, to take charge of the shows.

25. The Board have recently issued a circular to the Collectors of the districts visited by the travelling show party to find out whether the improved ploughs sold by Messrs. Massey and Co. are being used by the ryots and what defects, if any, have been detected. Two Collectors have replied to this requisition and their reports

are, on the whole, encouraging. But, as pointed out by Mr. Benson, the chief difficulty in the way of introducing improved implements into this country is that of repairing them when they get out of order, as the village blacksmith is unable to set them right. This question has been under consideration for some time. Mr. Price recommended that a trained blacksmith should be entertained and sent out with the officer in charge of the travelling show to repair such ploughs as may have got out of order and to teach the village blacksmith how to do the work. Government, however, did not approve of this proposal. In the mean time it was thought that, if the loan of the services of one of Messrs. Massey and Co.'s trained men could be secured, he could be sent round to the localities visited by Mr. Benson last year. But after some correspondence with that firm the matter was dropped, as it was found that none of their men were willing to accept the terms which were offered. The Board understand, however, that Messrs. Massey and Co. intend to send out some of their men to exhibit the working of their ploughs, to adjust and repair such as may brought to them, and to instruct the village blacksmiths how to execute repairs. It is hoped that this excellent example will be followed by other manufacturers as well as by the agricultural associations that are being started in some of the districts, *i.e.*, the Madura Farmer's Club and the Association at Tinnevelly.

26. The Board have also arranged to send one of their agricultural inspectors to the districts referred to, to find out exactly what difficulties and defects are met with in working the ploughs and to report through the Collectors how they can be overcome. On receipt of this report the Board will submit their views as to what might be done in this direction. The question is one of great importance and one in which manufacturers of improved agricultural implements and their agents are also greatly interested.

27. In paragraph 20 of his report Mr. Benson states that though he recommended some three years ago that steps should be taken to introduce the bamboo seed drill of the Ceded districts into other parts of the presidency, little has yet been done in the matter. The Board observe, however, that Mr. Benson's suggestion was communicated to certain Collectors and they were subsequently requested to state how far the introduction of the drill was successful. The Collector of Trichinopoly reported that the ordinary bullock power of his district was insufficient for working the drill and that the orifices were found to be too small for some grains and too large for others. As it is the skill of the sower and not the size of the orifice that renders the drill suitable for seeds of different sizes, some drills were exhibited and their working shown by Mr. Benson himself in July and August last year in Tinnevelly when he visited the district in charge of the travelling show. He reports that the advantages of drill-sowing were not appreciated, and that in fact it appeared "to be too far advanced for the comprehension of the average ryots as yet" (paragraphs 7 and 10 of his report in G.O., No. 1100, dated 26th December 1886).

A drill has recently been supplied to the Collector of Vizagapatam, the one sent him before having been found to be broken.

28. In paragraph 52 of his report Mr. Benson complains that nothing has been done regarding the formation of a museum of agricultural implements. The Board observe, however, that the Director in paragraph 43 of his last report expressed a doubt as to whether it was necessary for this department to do anything in the matter as the Educational department had undertaken to make a collection of the kind. Mr. Benson was asked in January last for some further information, which he has not yet furnished.

29. *Exhibitions.*—For the first time after an interval of nearly a quarter of a century an agricultural exhibition was held on the 29th to 21st March last at Gooty and another at Erode on the 19th to 21st April. A full report on the two exhibitions has already been submitted to Government. The number of visitors at the Gooty show was 6,127 and that at the Erode show was about 10,000. The cost of the two shows (Gooty Rs. 4,319 and Erode Rs. 4,792) was Rs. 9,141, of which Rs. 6,444 or 70 per cent. were given away as prizes.

The show of ponies and mules at Gooty was poor, but the cattle exhibited, though small in number, comprised some very good specimens. Mr Mills observes

that "better bulls could not be wished for than most of the Nellores exhibited." Regarding the cows and heifers, most of which came from the Ongole taluk of the Nellore district, Mr. Mills says: "I cannot speak too highly of them." Vegetable products were well represented. Under "animal products" there were only twenty exhibits, but under "manufactures" there was a fair show though nothing novel or remarkable was exhibited. There were fine cotton carpets from Adóni, Bhaváni, Dharwar, and Cumbum, those from Bhaváni and Dharwar carrying away the first and second prizes, respectively. Under "implements and machines" there was a good show of both indigenous and imported or improved implements, the latter having been contributed by Messrs. Oakes and Co., Massey and Co., and Ormerod and Co. It is only as regards ploughs and sugar-mills, however, that a comparison between the relative merits of the European and Native implements was possible, as the other kinds of European implements were wholly novel to the ryot and did not excite any great interest. The result of the comparison was, with one exception, in favor of the imported or improved implements, the exception being in regard to a plough for breaking up cotton soil and rooting up "nuth" grass, for which the well-known ponderous "Pedda Madaka" (big plough) of the Ceded districts was found to be better suited than all the other ploughs exhibited and gained the second and third prizes, no first prize having been awarded.

30. The Erode exhibition was not so successful as the Gooty one, especially as regards live-stock. The show of ponies was disappointing, that of cattle poor, and that of sheep very poor. It was thought that the poorness of the show of live-stock was due, not to the want of many very good specimens in the districts comprised in the show circle, but to the short notice, the want of energy and enterprize on the part of the owners, the smallness of the prizes offered, and, above all, to the prevailing superstition regarding the "evil eye." The show of vegetable products was decidedly good, both as regards number and quality, but that of animal products was poor, except as regards tanned hides and skins, while that of manufactures was not nearly so good as might have been expected. There was a good show of implements, and the relative merits of the European and country ploughs were tested by actual working as at Gooty. The ryots, however, considered the imported ploughs to be too heavy for the cattle, and too costly or difficult to set right when they got out of order.

On the whole, considering the novelty of the exhibitions and the shortness of notice to the rural population, the Board are decidedly of opinion that the results of the two shows are most encouraging.

31. An agri-horticultural show was held at Coimbatore on the 19th January last. It was organized by the leading citizens of the town and is understood to have passed off well. Rs. 3,407 were collected by voluntary subscriptions in the district and the total expenditure was Rs. 2,328, of which Rs. 1,373 represented the value of the prizes. It is gratifying to note that the committee who managed the exhibition did not find it necessary to accept the contribution of Rs. 500, which the Government, in compliance with the committee's request, offered to give them, as their receipts more than covered the expenditure. It is to be hoped that the show will be repeated at Coimbatore, and that similar shows got up without Government aid will be held in other important mofussil towns.

It is a matter for regret that the Farmer's Club at Madura were not able to hold any show similar to the very successful one of May 1885.

32. *The Colonial and Indian Exhibition, London.*—As stated in paragraph 42 of the last report, a collection of models of agricultural implements, and of cocoons, raw silk, silk fabrics, indigo cakes and tobacco leaves and cigars was contributed by this department for the Colonial and Indian exhibition. It is understood that it met with approval.

33. *Sale of Agricultural Implements.*—The Board have ascertained from Messrs. Oakes and Co., Massey and Co., and Somina Sooriah and Co. of Cocanada that 384 ploughs and 310 sugar-mills were sold by them in the year under report. Messrs. Oakes and Co.'s agent at Hospet sold sugar-mills of the value of Rs. 25,000 in 1886. The Beheea sugar-mills are now coming into rapid use in the Bellary and Godávari

districts. They are in use also in some villages in the Coimbatore and South Arcot districts.

34. *Silk.*—The action of this department in this direction was still in a preliminary stage at the close of the year. Samples of cocoons collected in the Kámbakam jungles of the Chingleput district were furnished to Mr. Cleghorn of Bengal, who had kindly consented to reel silk from them. Some of the cocoons were fresh and some pierced. The fresh ones gave an average of 80 tolas of raw silk per kahon of 1,280 cocoons. One cocoon gave a single thread of 1,194 yards and another of 800 yards. Mr. Cleghorn was of opinion that the quality of the fibre was superior to any tassar that he had had to deal with. In view of this very favorable report and as the trees, on the leaves of which the tassar worm feeds, abound in many parts of the presidency, the Board have recently submitted to Government certain proposals for the systematic rearing and collection of cocoons.

35. *Agricultural Experiments—Wheat and Barley Experiments on the Nílgiris.*—Allusion was made in paragraphs 51—54 of the last report to certain experiments which were made to introduce English and Punjab wheat and barley on the Nílgiris. The results of the experiment are summarized in paragraphs 38—40 of Mr. Benson's report. The English barley succeeded very well and gave a good crop which was purchased by the Nílgiri Brewery Company. The Punjab barley was found to be inferior to the species found in the district and no further attempts will be made to introduce it. The Punjab wheat succeeded fairly well. The flour was of very good color but was unsuitable for bread-making, the outturn of *soojee* being poor. The English wheat was a decided failure, the plants having withered in every case without producing ears. The wheats tried were of the soft kinds. It is intended to try white and red wheats of the hard variety from Belgaum and Dharwar in Bombay, Mozaffarnagar in the North-West Provinces or the Malwa.

36. *Distribution of Seeds.*—With reference to paragraphs 42 and 43 of Mr. Benson's report regarding seeds distributed to districts for experiments, the Board have since received reports from almost all districts and find that the experiments were in most cases utter failures. In South Arcot, however, Havanna, Kentucky, Virginia and Pensylvania tobacco seeds sown in two villages are reported to be in a thriving condition and to promise a fair yield.

Water Melons succeeded well in Ganjam.
Madagascar Paddy succeeded in three villages in the Nellore district.
Cawnpore Indigo did well at Gúdúr in the same district.
Manilla Hemp grew luxuriantly in the Tindivanam taluk of the South Arcot district.

With these few exceptions the experiments have everywhere been a failure.

37. *Babul (Acacia Arabica) Bark and Pods.*—It was stated in the last report (paragraph 55) that no sale could be found for the trial consignments of bark and pods sent home and that some consignments of bark had been sent to Australia to see if an outlet could be found for it there. The Board have since learnt that no buyers could be found at Melbourne or Sydney, and that the bark was sold at a loss at Adelaide. No further attempts will, therefore, be made to develop a trade in this article.

38. *Tobacco.*—With a view to improve the tobacco of this presidency, so as to make it suitable for the European market, Government have decided upon engaging, for two seasons, the services of a tobacco curer, who has learnt his work at the Poosa factory in Tirhut. The curer will instruct tobacco growers both as to cultivation and curing. His services will be available from the next tobacco sowing season.

39. *Linseed.*—With reference to paragraph 35 of Mr. Benson's report, it is observed that the London brokers, whose reports have since been received, are of opinion that, as Indian linseed oil is already well known in the home market, Government need take no action in the matter. The Secretary of State has, however, forwarded a small supply of the Balkan seed which will be tried in due course.

40. *Mahogany Plants.*—Some 2,000 plants were purchased by this department from the Agri-Horticultural Society's Gardens, Madras, and distributed as follows:—

To whom distributed.	No. of plants distributed.
Conservator of Forests, Northern Circle	1,200
District Forest-officer, Chingleput	150
Do. do. North Arcot	150
Do. do. South Arcot	150
Do. do. Trichinopoly	350
Total ...	2,000

The Conservator of Forests, Northern Circle, distributed the 1,200 plants sent to him to Cuddapah and Nellore. The results are reviewed in a recent report of the Conservator, who says that the plants were badly basketed and were eaten by white-ants. The plants raised in the forests of the same districts and in those of the Kistna and Nílgiri districts, from seeds received from Calcutta and Ootacamund, did fairly well. Of the 350 plants sent to Trichinopoly, 299 were doing well and averaged $2\frac{1}{2}$ feet in height at the close of the year.

41. *Date Palm.*—Seeds and offsets of the Arabian date palm were obtained by the Board of Revenue and furnished to the Forest Department for trial. The results of the trials have not yet been reported by the Conservators.

42. *Bee-keeping.*—Nothing has been heard from Dr. Shortt and Mr. Nicholson of Yercaud. In this connection the Board beg to record their deep regret at the death of Mr. J. C. Douglas, who took great interest in the subject and had promised to send some Italian bees to this presidency.

43. *Insects affecting Crops, &c.*—Specimens of insects which injured crops in the Vizagapatam, Godávari and Bellary districts were sent to the Superintendent of the Indian Museum, Calcutta. Those from the first-named district were identified by him as a species of moth belonging to the family *Arctiidæ* known to Entomologists under the name of *Alope Ocellifera.* Mr. Wood-Mason thinks that the most effectual remedy for exterminating these insects is that suggested by the Deputy Tahsildar of Bobbili, viz., to destroy as many eggs, caterpillars, cocoons, and moths as possible. He also states that if the growth of castor plants, which are the favorite food of the insect, were encouraged in waste lands near cutivated lands, the pest would probably be drawn away from the crops. The specimens of insects sent from Godávari and Bellary were identified as species of *Pyralidæ* and *Achœa Melicerti*, respectively.

Cattle-breeding and Veterinary Inspection.

44. *Government Cattle.*—The cattle belonging to the late Saidápet Farm have been in charge of the Principal of the College of Agriculture. They, as well as the Amrat Mahal cattle stationed on the Pulneys and at Devakolam, were, on the whole, doing well during the year.

45. *Stock-breeding.*—It was stated in paragraphs 61 and 62 of the Director's last report that the idea of establishing a stock-breeding farm had been given up by Government on account of the large initial and annual outlay which it would entail and on account of the risk involved, as the stock bred might not be of the kind wanted and that, therefore, it was decided to place selected sires and dams in a central depôt, to be drafted thence, when of proper age, for use to selected districts or portions of districts where the cattle are poor and need improvement. Considerable difficulty was experienced in obtaining a suitable site for the central depôt. This has, however, now been overcome and a good site has been selected near Hosúr in the Salem district, where the requisite sheds and buildings are being erected under the supervision of Mr. Dumergue, the Sub-Collector.

The cattle now in charge of the Principal of the College of Agriculture will be moved into the depôt as soon as the cold weather sets in, and the stock will be added

to by purchase as far as funds will permit. The Board hope to be able to report some tangible results in the current year.

46. *Pony-breeding.*—From July 1886 to January last there were two stallions at work in the Coimbatore district and two in the Hosúr division of the Salem district. Four more stallions were purchased and sent to Coimbatore in January 1887, so that there are now six stallions in that district. The number of mares covered during the year was 75 in the Coimbatore district and 26 in the Hosúr division, total 101. The results are not as satisfactory as might be wished, but it must be remembered that four of the stallions were purchased only in January last, and were, therefore, at work for only three months. One of the old stallions was ill and was not fit for work for a month. The chief reason, however, for the smallness of the number is to be found in the fact that the village tats, unfit as they are for breeding, are often let loose to graze and monopolize the mares. As remarked by the Director last year, it is not possible to compel owners to castrate the undesirable sires, but, as a first step towards lessening the existing evil, Government have sanctioned the employment of trained salustries to castrate entire ponies and to treat the sequelæ and have also authorized the grant of a reward not exceeding Rs. 3 for each pony brought for castration and the provision of handsome prizes for geldings at future agricultural shows.

Salustries were accordingly entertained in Coimbatore and in the Hosúr division of Salem, and though they commenced operations very late in the year, the number of ponies castrated in Coimbatore, before the end of March, was sixteen and that in the Hosúr division up to 23rd April last fifty-eight. It is satisfactory to note that all the cases were successful and not a single casualty occurred. Orders have recently been issued to castrate bulls also and operations are now in progress. There is reason to hope that, under the influence of the measures now being pushed forward, viz., castration of ponies and bulls, and stock and pony-breeding, there will, ere long, be a marked improvement in the cattle and ponies of the Coimbatore and Salem districts.

47. *Ensilage.*—Allusion was made by the Director in paragraph 66 of his last report to the ensilage experiments which the Government had ordered to be made on a large scale. As yet reports have been received from only five officers, viz., Mr. H. G. Turner, Collector of Vizagapatam, Mr. Nicholson, Collector of Anantapur, Mr. Horsfall, Sub-Collector of South Arcot, Mr. W. Dumergue, Sub-Collector of Salem, and Mahomed Ali Sahib, District Forest-officer of Chingleput.

Mr. Turner's experiments were a failure on account, probably, of the rain which fell during the time when the silo was being filled. Cattle would not touch the silage.

Sixteen silos were made under Mr. Nicholson's orders; of these, nine were opened in May, June and July last, when it was found that the silage in six was good and, its flavour being pleasant, it was eaten by cattle. In one, which was filled with green paddy stalks and spear grass, the silage was mouldy and had a strong smell. It was not offered to cattle, but they were found to pick up the stuff lying around the silo afterwards. The silage in two was useless and emitted a strong unpleasant smell. The remaining six silos will be opened later on.

Mr. Horsfall's own experiments were unsuccessful, but a ryot of Gingee, named Narainsami Nainar, was more fortunate. He made three silos under Mr. Horsfall's guidance and advice in November and filled them with over-ripe hill grass, ripe field grass and dry ragi stalks, respectively. The three silos were opened on the 9th June when it was found that, though the over-ripe grass and the dry ragi stalks were a failure, the grass from the fields was an astonishing success, every blade of it having been eaten most greedily by cattle which had never seen silage before.

Mr. Dumergue's experiments were as successful as could be wished. His silo was 30′ × 12′ × 6′ and was filled with the ordinary kinds of grass in September 1886. It was opened on the 23rd March last, and was found to emit a strong smell not unlike that of a tannery, but this smell evaporated after a few hours' exposure. The silage was then found to be so good that Mr. Dumergue had more applications from ryots than he could comply with. Cattle and country ponies ate it most greedily

and throve well upon it. The castrated ponies were fed with it, mixed with grass for a short time and finally without any mixture at all and throve well. In one case the effect was remarkable. A man brought a pony for castration in such miserable condition that it did not seem able to stand the operation. The owner, however, insisted on its being gelt, as it was so troublesome and gladly accepted all risks. Contrary to expectation the animal recovered quickly and was not taken away for a fortnight after, during which time it was fed on nothing but silage. The owner at last came for it and, when told to take it, did not recognize it. "I brought it here so thin" he said "and now it is so fat, what is this?".

Mahomed Ali Sahib, District Forest-officer, Chingleput, had two silos constructed and filled with grass. One of them was opened on the 23rd March last and emitted an unpleasant smell; the silage was readily eaten by cattle, but refused by ponies, sheep, goats and donkeys. On the following day the silage was exposed to the air for a little while and was eaten by 300 head of cattle. On the third day, when His Excellency the Governor was present, the silage was offered to the cattle at the Guindy Park and to some other cattle and was fairly eaten. A milch cow, a bullock and a milch buffalo were hired and fed for one week on the silage mixed with paddy straw. At the end of the week the animals were weighed and showed the following results:—

—	Milch cow	Milch buffalo.	Bullock.
	LB.	LB.	LB.
Beginning of the week	356	536	365
End of the week	361	546	365
Difference ...	+ 5	+ 10	...

Mahomed Ali Sahib's second silo was opened on the 8th June last, and though it emitted no unpleasant smell, cattle refused to touch the silage. He thinks that the failure was due probably to the coarseness of the grass used which was also too ripe when it was put into the silo.

The Board consider that there can be now no doubt that grass can be silaged in this presidency, though more experience is needed to ensure the fitness of the product. They will take steps when all the reports have been received to publish the results as widely as possible.

48. *Inspection of Cattle Disease and Veterinary Hospital.*—The Cattle Disease Inspection department consisted of an Inspector, a Deputy Inspector, eighteen Local Inspectors, and one Probationer. Mr. Mills' report for the year is appended to these proceedings.

49. The number of animals admitted for treatment in the Veterinary Hospital at Saidápet was 198 against 339 in the preceding year. The falling off is attributed by Mr. Mills to his own absence on tour for six months (from July to December) and to the fact that there was no serious outbreak of disease in the villages in the neighbourhood. The Board observe that the number of animals admitted from 1st July to 31st December last was 119 against 111 and 77, respectively, during the corresponding periods of the two preceding years. Mr. Mills' absence on tour does not, therefore, seem to have affected the admissions to the hospital. The second reason assigned by Mr. Mills for the falling off seems, however, to be probable. Forty-one animals belonging to the late Government Farm and suffering from epizootic aphtha and 75 belonging to Guindy Park and suffering from braxy were admitted in January 1886 alone for treatment. There were no such abnormal admissions during any part of the year under report.

50. No further experiments in protective inoculation were made, as Mr. Mills considered that all that was necessary had already been done. It is probable that a

laboratory will be established by M. Pasteur in this country when further experiments will be conducted in connection with it.

51. The following table shows the statistics of cattle disease and mortality during the year:—

Disease.	Number attacked.	Number died.	Percentage of deaths to attacks.
Epizootic aphtha	67,454	6,546	9·70
Rinderpest	47,491	33,789	71·15
Anthrax	22,381	18,558	82·92
Variola	17,678	9,839	55·65
Other diseases	26,049	21,843	83·85
Total ...	1,81,053	90,575	50·00

As in the preceding year, epizootic aphtha, rinderpest and anthrax were the most prevailing diseases. The total number of deaths from these and other diseases was 90,575 or ·47 per cent. of the total number of cattle returned for the presidency. Kurnool, North Arcot, Cuddapah, Bellary, Vizagapatam and Chingleput show the largest number of deaths.

52. Besides the deaths mentioned above, 144 cattle are reported to have been killed by poisoning, while 44,065 are said to have died from natural causes. It is somewhat remarkable that nearly half the number of deaths from poisoning occurred in the district of Anantapur.

53. *Cattle Census.*—Under instructions from Government the statistics of agricultural stock furnished by curnams were tested by Divisional officers without previous warning in the marginally-noted districts, and it was found that the village returns had not been prepared on any uniform principle. In some villages only the cattle of pattadars or ryots holding land direct from Government on the ryotwari tenure have been shown in the accounts and not those of inamdars and other classes. In some cases animals under five years of age and calves and heifers have not been shown. The form prescribed in the old Village Manual for recording these statistics was somewhat defective. This has been rectified in the revised Village Manual and clear instructions have been laid down, which will prevent the recurrence of such omissions in future.

1. Ganjam.
2. Kistna.
3. Cuddapah.
4. Anantapur.
5. Trichinopoly.
6. Salem.

Rail-borne Trade for 1886-87.—The registration of traffic by rail was commenced in this presidency in April 1885. The total trade amounted to 34,900,632 maunds and compares with the trade of the previous year as shown below:—

——	1885-86.	1886-87.	Increase.	Percentage increase.
	L. MDS.	L. MDS.	L. MDS.	
Imports from external blocks ..	2,312,296	3,023,780	711,484	30·77
Exports to do. ..	1,997,272	2,609,114	611,842	30·63
Internal trade	25,585,789	29,267,738	3,681,949	14·39
Total ..	29,895,357	34,900,632	5,005,275	16·74

External Trade.—The external tradeor the trade with other British provinces and Native States is chiefly confined to Mysore, Hyderabad and Bombay. The principal articles of import were grains, provisions, hides and skins and sugar. The exports which were chiefly from Madras City, North Arcot, Bellary, Malabar and Coimbatore consisted of rice, provisions, salt, timber and sugar. Compared with the preceding year there was a large increase in the import of gram, timber, oil-seeds, hides and skins, raw cotton and wheat. In the exports also there were increases in

the following articles, viz., timber, railway plant and rolling stock, provisions, sugar, til or gingelly and rice; on the other hand there was a decrease under "Grains, other kinds," gram, "oil-seeds, other sorts," and salt.

Internal Trade.—Of the trade within the presidency, the most important article was stone and lime which formed 23·14 per cent. of the total trade under this head. This article was chiefly required for the Harbour works. The proportion of the trade in the other principal articles was rice 13·54 per cent., salt 9·9 per cent., oil-seeds 7·77 per cent., provisions 6·59 per cent., "grains, other sorts," 4 per cent., gram 4 per cent., and sugar 3·79 per cent.

Traffic by road with the Native States of Mysore and Hyderabad.—The total value of the traffic registered in 1886-87 amounted to over 2 crores and 93¾ lakhs of merchandise and 18¾ lakhs of treasure against 2 crores and 87 lakhs of merchandise and 14½ lakhs of treasure registered in 1885-86. The details are given below:—

		1885-86.		1886-87.	
		Merchandise.	Treasure.	Merchandise.	Treasure.
		RS.	RS.	RS.	RS.
Mysore ..	Exports to ..	71,52,735	3,73,689	73,71,971	4,25,188
	Imports from ..	1,36,01,255	2,39,235	1,36,02,624	3,17,939
Hyderabad..	Exports to ..	30,07,966	960	33,87,548	3,352
	Imports from ..	49,77,495	8,49,600	53,15,426	11,38,366
Total ..	Exports to ..	1,01,60,701	3,74,649	1,07,59,519	4,28,540
	Imports from ..	1,85,78,750	10,88,835	1,86,18,050	14,56,305
	Total ..	2,87,39,451	14,63,484	2,93,77,569	18,84,845

Trade with Mysore.—The principal articles exported from this presidency to Mysore were animals and Indian cotton piece-goods (over 15 lakhs each); provisions, spices and oils (over 3¾ lakhs each); rice and paddy (3 lakhs); silk and tobacco (over 2½ lakhs each); and salt (2 lakhs). The principal articles imported were spices (28 lakhs); animals (26½ lakhs); coffee (16½ lakhs); sugar (7 lakhs); rice and paddy (5½ lakhs); cotton piece-goods, Indian and European (5 lakhs each); timber and wood (4¾ lakhs); and seeds (3¾ lakhs).

Trade with Hyderabad.—The chief articles exported to this State were European cotton piece-goods (7½ lakhs; Indian cotton piece-goods (5 lakhs); fruits and nuts (over 4¼ lakhs; tobacco (3¾ lakhs); rice and paddy (over 2¼ lakhs); sugar and other saccharine produce (over 2 lakhs); salt (nearly 2 lakhs); and spices (over 1½ lakhs). The imports consisted chiefly of seeds (over 28½ lakhs); opium (over 3¾ lakhs); oils and provisions (2½ lakhs each); timber and wood (2 lakhs); raw cotton (1¾ lakhs); and animals (1½ lakhs).

(A true Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Secretary to Government, Revenue Department.

ENCLOSURE No. 1.

ANNUAL REPORT OF THE ASSISTANT DIRECTOR OF AGRICULTURE.

Personal.—From the beginning of April till June, I was engaged at Madras in office work, but on the 8th of the latter month proceeded to Karúr to inspect the Nerur padugays, which it was suggested might prove useful in connection with the proposed stock farm; at the same time I visited Mr. Little's farm near Karúr. On the 2nd July I proceeded to Chidambaram, in charge of a travelling show of agricultural implements, and was absent from head-quarters till the end of August on this

duty, visiting various places in the Tanjore, Tinnevelly, Madura, Trichinopoly, and South Arcot districts with the show. On the 10th September I again left Madras, this time for Kurnool, to make inquiries in connection with the analysis of that district and in order to supervise and instruct the inspectors who had already started work there. I remained in the district till the 21st October and then returned to Madras for a few days. From Madras I proceeded to Hosúr to inspect some land near there which it was thought would be suitable for a stock depôt, and thence to Coimbatore to see the Collector regarding the exhibition at Erode. This kept me till the 7th November. As I was starting for Kurnool again on the 9th November, news arrived that the Railway had broken down, and I was delayed in Madras a few days; but, leaving on the 14th and proceeding first to Gooty in connection with the exhibition to be held there, I then marched through parts of Kurnool on another tour of inspection and inquiry, and returned to Madras on the 14th December. I halted at head-quarters during part of the Christmas holidays; but, leaving Madras on the 3rd, I spent January in the Cumbum and Márkápur taluks of Kurnool, thus completing my examination of the district, and returned from the latter taluk over the Dornál pass to Atmakúr and Nandyál and thence to Madras by the 15th February. I halted in Madras for the celebration of Jubilee and then proceeded again to Hosúr for a further inspection of the land available for the stock depôt; thence to Whitefield, where I visited the Eurasian settlement; then to Erode, whither business in connection with the exhibition took me; and lastly to Madura, to inspect the farm belonging to the Madura Farmer's Club, returning to Madras on the 4th March. There I halted till the 21st idem, when I proceeded to Gooty to take executive charge of the show there. This work detained me till the 1st April, and I returned to Madras on the 2nd.

2. Most of the year was thus spent on tour. It was very unfortunate in some respects that the travelling show engaged my attention during July and August, when it was most desirable that the Agricultural Inspectors, then newly started at work in Kurnool, should be closely supervised and carefully instructed. It was unfortunate for them and bad for the work. I represented this at the time, but it was considered necessary for me to go south instead of north.

3. It is also very evident that the growing work of the department is more than one officer can properly attend to, and the work is likely to expand rapidly in the future. The district analysis work is enough to occupy the attention of a single officer always, and, even if the plan of carrying that on is entirely revised, the work of getting our statistics into proper order will require a great deal of labour and attention.

I.—Land Records.

4. The improvement of the statistical records available has been stated to be one of the chief functions of the Agricultural department. A great step has been taken in preparing the new manuals of village and taluk accounts, but still much remains to be done. This is chiefly in the provision of means for testing and checking the returns regularly, and in seeing that they are properly prepared and not fudged as is too often the case at present. In the course of my tours in Kurnool, I paid great attention to the subject, but of course having no status in the district could do little towards improvement. Peculiarly I almost invariably found that the cropping statistics of the cusbah villages of taluks were almost the worst kept in all taluks.

5. As far as this department is at present concerned, the statistics which require most attention are—

(1) *The Cropping Returns.*—Now not checked in the field and not tabulated in any definite manner.

(2) *Record of Water-supply and Irrigation.*—Now fairly complete as regards irrigation, but altogether wanting as regards subterranean water-supply.

(3) *Returns of Live and Dead Stock.*—Now prepared in a haphazard manner and never checked.

(4) *Registers of Cattle-disease and Mortality.*—Now ordered to be kept in a form which is far from clear and not at all closely looked after or checked as they should be.

Regarding all these, I have the honor to submit suggestions during the past year, but as yet, as far as I am aware, without any results. For Kurnool we have completed a tolerably complete record of the water-supply and checked carefully a return of live and dead stock for all villages, besides doing something to get the cattle disease registers into better order. No attempt has been made to check in detail the cropping returns in Kurnool; the matter was under discussion during the year, but it was considered that the work would be more than the Agricultural Inspectors could get through. It is to be hoped that in the future the available force will be made sufficient to deal with this subject also.

II.—The Analysis of Districts.

6. As related in the last report, the year started with a large portion of this work being taken out of my hands. In their order, dated 25th June 1886, No. 528, however, Government decided that the tractwar plan, the importance of adhering to which I have all along urged, should be adopted, and this led subsequently to the whole of the work for both the famine and agricultural analyses being combined and placed in my hands late in the year, and to a representation being made to Government of the stupendous nature of the work and the necessity, if it is to be carried out, of providing a large staff of clerks to collate and tabulate the statistical information which exists. Orders on this latter reference have been received since the close of the year, and in persuance of further instructions from the Government of India, the method to be followed in future will be entirely revised. It seems probable that the task of working up the analyses will be deferred to some future date when the statistics available have been made more trustworthy than they now are.

7. To collect information in the district to be analysed, a staff of seven Agricultural Inspectors was sanctioned from the 1st April 1886, but it was decided to appoint only five of them at first. Five passed students of the Agricultural College were selected; but of these two, after accepting the appointments offered them, did not take them up, on hearing that they would have to work in Kurnool; one Inspector was immediately detailed for other work on the Nílgiris, and one was kept for about two months on duty in the Centeral office at Madras, so that only one Inspector commenced work in Kurnool in April. Considerable delays occurred in filling up the two vacancies referred to, and it was not till the beginning of June that two more qualified men were obtained and sent to Kurnool. Early in that month there were four Inspectors at work there, and at the beginning of July a fifth was appointed and sent to the district. Towards the end of July one of the Inspectors, who had not been working satisfactorily, relieved the department of his presence by resigning. Up to this time the Inspectors had all been working under considerable difficulties, as the work was new to them, most of them were new to any district work, and several had only a limited knowledge of Telugu, and I was engaged on other duty in the south of the presidency and could not assist them or set them straight. Properly the Inspectors should, for some time after they were first sent out, have been kept under close supervision, but this was not possible as has already been shown.

8. Another Inspector was appointed in July and placed on duty in the Kistna and Godávari districts to inspect and report on the suitability of certain blocks of land offerred there for use in making certain experiments in the economy of irrigation water. After completing this, he also proceeded to the Kurnool district arriving there early in October. In the meanwhile at the end of August, the first Inspector deputed to Kurnool fell ill of fever, and did not return to duty during the year. At the beginning of September, to fill up the vacancy caused by the resignation above mentioned, yet another Inspector was appointed and set to independent work early in October. This last appointment brought the strength up to the sanctioned number, with one man absent on sick leave. But towards the end of September, after three months' trial, it was found necessary to get rid of another of the Inspectors, a Mahomedan, and it was not possible to fill up the vacancy thus caused until early in November. The Inspector who had been on duty on the Nílgiris also became available then for work in Kurnool, and by the middle of November six Inspectors were working in that district. Until the early part of December work was confined to the six taluks west of the Nallamalais,

but during that month three Inspectors were diverted to the Cumbum and Márkápur taluks. At the beginning of January another qualified man was appointed to act in the vacancy then existing, bringing up the strength to seven only, six of whom were on duty, one being absent owing to ill-health (fever). Early in February the acting Inspector's health gave way after not a month's work and he resigned his appointment. Early in March and towards the end of the month, two more Inspectors were obliged to take leave owing to ill-health, whilst all the others, who remained on duty during the year, suffered more or less severely from the effects of the climate and the nature of their work.

9. Owing to the difficulties in getting a staff together, the diversion of some portion of the Inspector's time to other work, the ill-health common more or less to all, and to the fact that the Inspectors started under most unfavorable circumstances on new and untried work without any one to guide them who was near by, there has been considerable delay in completing the work which they have attempted. This has been, first, to check carefully a special return of the live and dead stock of the ryots in all villages, and secondly, to prepare a return of the water-supply of every village with special reference to wells and underground water. The Inspectors have also had to note and report on the agricultural systems and practices of the localities in which they worked according to the scheme shown in appendix I-B to my last annual report.

10. Taken, as a whole, the work done by the Inspectors has been satisfactory since my visit to the district in September and October last. It still remains to work up the results and notes which are now on record. At the end of the year the following number of villages had been or remained to be examined in the taluks noted:—

Taluks.	Villages	
	Examined.	To be examined.
Pattikonda	78	31
Rámallakót	103	6
Nandikótkur	100	...
Nandyál	92	...
Koilkuntla	81	5 partly.
Sirvel	40	45 do.
Cumbum	74	33
Márkápur	68	28

The whole work was completed by the 13th May.

11. The task of working up the results of my own and the Inspectors' inquiries and of tabulating all the available and collected information tractwar still remains to be completed. For the latter portion of the work, no provision has yet been made, and the matter is still under discussion. As regards the former, my time is usually so much cut up by the various calls on it, which take me hither and thither that I find it difficult to make much progress. The work requires that I should sit down steadily for about three months and collate all the available information. The Inspectors have now been brought to head-quarters to put the whole of their notes together in a clear form for my use. Until that and the compilation first alluded to is done, I cannot complete my work.

III.—Exhibitions.

12. After a pause of three years, and at the last moment, two mofussil agricultural exhibitions were organised during the past year. One did not come off till after the close of the official year, but as it properly belongs to the work of the year under report, it may be referred to below.

13. The mofussil exhibitions were resolved on in 1883, after the last central exhibition held at Madras in that year, and it was then decided to hold two mofussil exhibitions annually for four years, and in the fifth year a central one at Madras. In the first year from a bad season, and in the second and third owing to financial exigencies it was not possible to hold the mofussil shows. In the year under report owing to frequent changes in the direction of the department, it was not until my

return to Madras in October last that the draft prize lists were sent out to the Collectors of Coimbatore and Anantapur for their remarks, and not till early in December that they were submitted to the Board and Government for orders. Some alterations then introduced at the suggestion of the Board were found to make the prize list unworkable in some respects, but Government refrained from revising them as they were submitted at so late a date.

14. Owing to the delays referred to, and to the recommendation of the Collector of Anantapur, it was found necessary to defer the Gooty show till the end of March, and that to be held at Erode till the 19th April. The date fixed for the Gooty show was found very inconvenient, and it should be possible to arrange that both the shows may be held during or before the month of March in future and that the latest of the two should close before 24th or 25th of that month, to allow of all accounts being closed before the end of the official year.

15. I have not yet seen the official reports of these shows, but from my own observation have no hesitation in saying that the Gooty one was much the more successful. It was characterised by a fine gathering of working cattle, for which, peculiar to relate, the prize list did not contain a single prize. These cattle were chiefly of the Nellore breed, which reaches probably its greatest development on the black-cotton soils of Kurnool and Cuddapah; but there were good representatives shown of other distinct breeds raised locally either in Anantapur or Kurnool. Besides this, the Nellore breed was represented by some good cows, heifers, and calves brought all the way from Ongole by their owners. The show of buffaloes was of the most meagre description, probably because these animals, at least the cows, are in charge of the womankind of the ryot's family. The sheep and the ponies were very poor. The collection of produce was, on the whole, good, and that of manufactures interesting; whilst in the implement section the show of the characteristic implements of the Ceded districts must have been stricking to any one only acquainted with what the Tamil ryot uses, and the stands of Messrs. Massey and Co. and Messrs. Oakes and Co. contained a very fair show of ploughs, the utility of which was demonstrated during the exhibition, and of other implements and machines more or less suitable for use in India. The show was visited by a very considerable number of people, and, on the whole, was successful.

16. At Erode, the show of cattle was poor, of sheep bad, of ponies inferior, and of buffaloes *nil*. The produce brought in made a good show, especially the classes of cereals, pulses, oil-seeds, sugar, tobacco, and timbers, but in other divisions was not of great value. It was much aided by exhibits from Cochin and Travancore, especially of timbers. In the section devoted to manufactures, the show, on the whole, was not good, although in some classes there was a fair number of exhibits of good quality. At this show the exhibition of implements was nearly all made by Messrs. Massey and Co. and Messrs. Oakes and Co., but two seed-drills brought down from Anantapur seemed to be beyond the comprehension of the local ryot. Here also successful plough trials were carried through on both dry and wet land. The arrangements at this show were not so successful as those at Gooty, the then recent changes of Collectors having been prejudicial to the show. Nevertheless the show was fairly successful, though it is to be hoped that on another occasion a better show of stock will be forthcoming.

17. It appears advisable that the selection of places for these shows should be reconsidered, and that the prize list and regulations overhauled thoroughly by a competent committee, after Government have laid down the general principles on which they should be framed. To make the shows a success, they must be repeated frequently—annually if possible—at the same place, and the prize list must be widely and thoroughly circulated a good many months before the shows are to come off. Unless the shows are repeated at or near the same place frequently, the people will not come to understand the objects of them, nor will they be encouraged to produce superior articles for competition and sale and the prizes will be so much money thrown away.

18. The question is now under consideration whether the show next year shall be held in Madras, according to original arrangements, or whether further shows shall be held in the mofussil before another Central Exhibition.

IV.—The introduction of improved Implements, &c.

19. For many years work in this direction has been carried on. Doubtless many errors have from time to time been made, but the work was for many years purely experimental in endeavouring to adapt the improvements made in the West to the conditions we meet with in India. Much labor and time were lost from defective information on the latter point. The officers of Government, who understood the plough, for instance, were kept tied down at Saidápet, instead of first acquiring a thorough knowledge of the ryot and his practices. Much groping in the dark consequently followed. However, no one can now deny that great progress has been made in the adaptations necessary, and the chief work ahead is to bring the value of these improvements home to the rural population.

20. Experience has proved that there are few implements and machines for which the time of introduction has come in Southern India. The more prominent of these are ploughs, sugar-mills, and boiling-pans. The bamboo seed-drill of the Ceded districts may also be advantageously brought into use in the Tamil countries, where it is as yet unknown. I recommended this in my report for the year 1883-84; but little has since been done in the matter.

21. In June last it was resolved to organise a travelling show of agricultural implements to visit the southern districts under my supervision. It started at the beginning of July, and during that and the following months visited many places in the South Arcot, Tanjore, Trichinopoly, Madura and Tinnevelly districts. At most places the show consisted of working the ploughs in dry and wet fields, and in exhibiting the other machines taken at work at some convenient place in the towns or villages visited. Almost everywhere considerable interest was excited by the show, and large crowds gathered to see and discuss the work. The chief intelligent interest centred round the smaller ploughs and towards the end of the programme of visits work was almost solely confined in the field to working Messrs. Massey and Co.'s E.P. and Indian Ryots' ploughs and Avery's Hindustan plough.

The former firm sent an agent with the show on all its travels, and sold a considerable number of ploughs from a stock sent out in his charge.

22. It is as yet too soon to judge what the real results of this show may be. They can only be estimated when the ryots have had time to use the ploughs they purchased. My opinion is that it will be necessary to send round some one over the same ground again to see that the purchasers of ploughs have not been disheartened by small difficulties and been led to abandon their use. The introduction of such novelties as these ploughs must always be a matter requiring persistent action and encouragement. This work is one particularly suited for local action, and Government can only make a beginning. The knowledge of the value of improved ploughs needs to be carried to every village, and the margin for profit on the smaller ploughs is so small that we can scarcely expect the manufacturers to sink large sums in doing this. The value of an improved implement of tillage to the ryots is also so great that it must always be a great object for Government to bring it to the notice of the people.

There always must be difficulties in the way of introducing such things as these ploughs, but the chief one now is, in my opinion, that of repairs. If we wish to see the ploughs brought into regular use, we must take steps to look after the people who are now trying the ploughs in different places.

23. The results of this show were so satisfactory to Government that it is intended to start another this year, and, if it is possible to find a man who is capable of taking charge of the show by himself, to continue the working of it throughout the year.

The real difficulty in arranging for making such shows permanent is in obtaining a suitable person to put in charge. A man is required, who not only thoroughly understands the articles he is in charge of, and who is capable of showing them well

and explaining their advantages to the ryots, but also who thoroughly understands the way in which the ryot looks on such articles and how he should be approached in order to recommend the novelties to him. He should also be active and energetic.

24. Besides the travelling show, not much has been possible in the direction of introducing improved implements, &c., during the year; but I cannot refrain from mentioning here the great loss which the cause of improved agriculture in Southern India underwent during the year in the early death of Mr. C. Krishnasawmy Mudaliar of Shiyáli, than whom no one perhaps has done more to demonstrate the utility, and profit to be derived from the use of improved ploughs, even under what are usually looked upon as unfavorable conditions. This was only a small fraction of what he did in a few short years, as numerous records of his work which have been published show.

25. No further trials with the sugar-mill and evaporator, referred to in paragraphs 22—24 of the last report, were possible during the year, but arrangements are now in progress for their being tried on sorghum crops raised in South Canara.

26. *The Beheea Sugar-mill* appears to continue to grow in favor as its value becomes known. Mr. Lloyd, Divisional Engineer of South Indian Railway at Villupuram, reported that he had worked the mill successfully in the South Arcot district, and that, after a week's trial to show the ryots how it worked, it was readily hired by them at the rates he asked, though he began late in the season after they had already made their regular arrangements for crushing their cane. At Hospet in Bellary also the mill has taken firm hold and a local agent now sets up the mills himself, and at the Gooty show exhibited a mill put together by himself, which carried off the first prize from one of Thomson and Mylne's own mills shown by Messrs. Oakes and Co., Madras. Messrs. Oakes and Co. report the demand for the mill to have been very good indeed. I am not aware of what success the mill continues to secure in the Godávari, but it is undoubtedly gaining ground generally. Wherever sugar-cane is grown for jaggery or sugar, there is room for its introduction.

27. During the year a competitor, for the favor which the above mill has met with wherever it has been introduced, was brought forward in this presidency, viz., Shanks' patent sugar-mill. I learn that some success has attended the introduction of the mill. It appears now that as there are several sugar-mills in the market that a full public trial of them is desirable and might be arranged for during the current year.

28. The Government of India during the year drew attention to certain hand centrifugals for separating sugar from molasses, which have been introduced with considerable success in Bengal by Messrs. Thomson and Mylne of Beheea, but it was not found possible to do anything in the direction of introducing these machines during the year.

The following report from Mr. J. A. D. Lloyd, A.M.I.C.E., Villupuram, regarding another of Messrs. Thomson and Mylne's adaptations, viz., their sugar-pans, will be read with interest. He says that these pans, as compared with the ordinary deep pans in use in South Arcot, "effect a considerable saving both of fuel and time in boiling down. The method of using the pans is to pour into them a small quantity only of juice at a time. The pans being so shallow, the steam is blown off as it rises, and evaporation is effected at once; the 'goor' is then scraped to the edge of the pan with wooden scrapers and the operation is repeated. The principle, on which the making of 'goor' of good crystalline quality depends, is to hurry through the various operations of extracting the juice and boiling down; any delay is apt to give rise to incipient fermentation, which once set up prevents the 'goor' from crystallizing. It is owing to this that 'goor' made from juice which has been expressed by the wooden mills of the district is of such inferior quality; the cane has to be passed twice through the rollers, and the juice is full of particles of broken cane and other impurities, so that by the time it is ready for the boilers the probability is that incipient fermentation has set up."

29. The following extract from a letter from Messrs. Massey and Co. will be of interest in connection with the subject of this section :—

"We find that the ryot is taking to improved implements, but very slowly. In most instances orders are being repeated where implements are at work, and duplicate parts called for. The difficulty is to manufacture sound and good implements at the price the ryot is prepared to pay."

Messrs. Oakes and Co. remark on the same subject as follows :—

"We should say that during tha past year the inquiries from native agriculturists have been far in excess of of previous years, and we think we notice a greater readiness to buy whenever they feel assured that the machine or implement really performs what is claimed for it. There is no doubt that the system of agricultural exhibitions in different centres introduced by the Government is doing an enormous amount of good to the country, which is not apparent on the surface. In our own experience we find that no business is done at the time of the exhibition, and we have often felt that our money and time had been wasted; but we have been agreeably surprised later to have further inquiries from natives whom we have seen at an exhibition, perhaps some months before."

V.—Farming and Farm Crops.

30. *The Saidápet Farm.*—This remained in charge of the department until September last, when finally orders were received sanctioning the transfer of parts of the estate to the Agricultural College, the Commissariat Department, and to the Veterinary Hospital. About 80 acres remain in charge of the department pending decision as to its final disposal. The farm buildings were transferred to the Educational Department, but as no other place was available for the location of the stock belonging to this department, a portion is still used for them. It is hoped that these stock may be removed during the early part of the current year, and all connection of the department with Saidápet shortly cease.

No actual farming operations of any sort were conducted during the year in the presidency by the department. The live stock belonging to it is even at present in charge of the Educational Department. Under these circumstances, there is nothing to report regarding direct farming operations.

31. *The Madura Farm.*—This institution continues to receive aid in the shape of a Government grant for the pay of the Superintendent. It was visited and reported on twice during the year. On the occasion of my first visit in July, I submitted a report, which was recorded by Government, to the following effect:—The general condition of the farm was more satisfactory than at my previous visit and field work was advanced. The stock kept still appeared too large and the provision for their upkeep insufficient; some of the cows and cattle appeared underfed and in bad condition, and the sheep flock was in a wretched state. The managing committee appeared to be scarcely working.

Early in March, the farm was again inspected. The season had been a bad one and for the most part the crops on the farm had failed. Though dairying is the chief undertaking, there was scarcely a blade of green fodder on the farm. The herd of cattle maintained is still very heavy, though less than at the time of the previous inspection. There are no facilities on the place for rearing young stock, whilst there were no less than 21 bull and 51 heifer calves and yearlings on it. Foot and mouth disease had been prevalent amongst the stock, and the Government animals looked poor. A set of interesting experiments on the feeding of dairy cattle was in progress, but had been complicated greatly by the outbreak of disease mentioned. Some interesting experiments had been started in shade-drying tobacco. I found it impossible to arrive at a correct view of the financial position of the farm from the records available.

At this visit, I had to consider the propriety of recommending the continuance of the Government grant after August next, and not being satisfied with the present arrangements, was led to make certain recommendations in consequence.

No report has yet been received from the Farmer's Club on the work of the farm during the past year.

32. *The Karúr Farm.*—This is rather an agricultural colony for the settlement of orphans rescued by the Wesleyan Missionaries at Karúr during the famine of 1876-78. No additional assistance was given to it during the year. It was visited in June,

when there was little to be seen in the way of crops or cultivation, but it appeared to be making progress as a settlement and the stock kept thereon to be in fair condition. Mr. Little, who has charge of the settlement, states that so much good cannot be done as might be owing to the fact that the weekly market at the neighbouring village of Uppidamangalam is held on Sundays. He also states that this day was only lately selected as market day.

33. The death of Mr. C. Krishnasawmy Mudaliar has already been alluded to. His estate was not visited during the year under report owing to the want of a convenient opportunity during his life-time.

34. *Irrigation Experiments.*—The sites in the Kistna alluded to in paragraph 71 of the last report and another selected by the Collector of Godávari were inspected during the year by an Agricultural Inspector, and his report was not at all promising. In submitting the results of his investigations, I was obliged to point out that I should personally inspect the sites and satisfy myself of their suitability before I could draw up any programme, and also that thereafter it would be necessary for me to visit the experimental blocks frequently in order to see that all was going on as it should. This, with my other duties, was evidently not feasible in the Kistna district, and the matter has been ordered to lie over till more time is at my disposal, when it is hoped that it may be possible to obtain results commensurate with the expense that may be incurred.

35. *Linseed.*—Some interesting results of an examination of the oil extracted from a quantity of seed obtained from Bellary and Kurnool were published during the year. The oil was expressed in a regular oil press and then examined by the Chemical Examiner and compared with some oil imported from England. The result was that the drying quality of the raw Indian and imported oils was nearly the same, there being a slight difference in favor of the imported oil, whilst the boiled oils showed no perceptible difference in their drying quality. Arrangements have been made to obtain a small quantity of Baltic seed for experimental cultivation, with a view to testing whether the climate has anything to do with the difference in the character of the oil produced from Indian and Russian linseed. Samples of the oil expressed from Indian seed have been sent home for valuation. The value of Indian linseed is, however, already well known at Hull.

36. *Wheat in Madras.*—Excluding the Nílgris, this crop is only grown at present to any appreciable extent in the Ceded districts, in Kurnool, Kistna and Coimbatore; Bellary, Kurnool and the Kistna growing the most, but in neither one of them has 8,000 acres of the crop been raised in recent years. This shows how small a proportion of the cultivated land is sown with this crop, and this appears to be probably due to a belief amongst the ryots, which prevails in Kurnool, that the crop is most precarious and very liable to disease or blights and in fact that they can never count on any outturn till the crop is fully harvested. There seems to be very little prospect of increasing the area under this crop in our southern districts, so as to produce it in quantities sufficient for export.

37. *District Crop Experiments.*—The chief feature of the year in this matter was the experiments made with English and Punjab wheat and barely on the Nílgiris alluded to in paragraph 95 of the last report under the supervision of the department.

38. A special detail report has been submitted on these experiments, but I may summarise the results briefly here. As noted last year, nearly all the English seed wheat imported turned out to be bad. The small quantity sent to the Nílgiris evidently belonged to a slow-growing winter variety and it tillered freely and did not do much more. The ryots in consequence came to regard it as a "sort of grass," and would take no care of the crops and consequently no results were obtained from it. The Inspector, who was detailed for charge of the experiments, had left the hills before it showed any signs of flowering, but the Collector subsequently reported that the plants in every case withered away without producing any ears.

This confirms the view I held last year that it was a mistake to experiment with slow-growing English wheats.

39. The Punjab red wheat turned out to be bad seed and so was a failure. The white wheat on the other hand grew fairly well and produced larger and finer ears than the indigenous variety, though it did not mature quite as rapidly. Some of the produce was ground and made into bread in Madras. The flour produced was of good color, but was not suitable for making bread. The bread baked was very bad in appearance, as the proportion of soojee turned out from the wheat was very low and the dough would not "rise." The following table shows the outturn obtained from this wheat and that usually obtained from other wheats at the Government Bakery, Madras:—

Sort of wheat.	Flour.	Soojee.	Coarse flour.	Bran.
Punjab white, grown on the Nilgiris	44·21	21·05	5·26	29·47
Ordinary Commissariat supplies of soft wheat { Doodiah ..	57	30	3	10
Ordinary Commissariat supplies of soft wheat { Ganjagelly ..	48	38	2	12

The soft wheats do not by themselves produce enough soojee for bread-making in India. In this case the outturn was very low also. The proportion of bran was very high, partly probably owing to the Nilgiri soils not being well suited to the crop and possibly in part to the crop having been reaped too early.

The experiments are not conclusive against further experiments being made to introduce wheat on the Nilgiris, but it appears that, if further experiments are to be tried, they should be made with some of the hard wheats. If any varieties can be found to succeed, the consumption by the troops and other bread-eaters on the hills will secure a market, and the ryot will be able to undersell the wheat brought from a distance, which now has to bear heavy charges for carriage.

40. The barley experimented with was both English and Punjab. The former grew well in most instances, developed good ears and yielded a fair sample of grain which has been readily purchased by the Nilgiri Brewery Company, and the ryots are reported to have reserved supplies of seed for sowing during the current year. It also appears evident that barley rather rapidly deteriorates on the Nilgiris and thus the continued introduction of fresh seed from time to time is desirable. The Punjab barley did not succeed nearly so well as the English, At starting it looked as promising, but dry weather followed and then it fell off, and in the succeeding heavy rains it suffered still more, so that the best crops only yielded a fair outturn.

In the following table some interesting figures regarding these barleys are shown:—

Description of barley.	Weight per measure.	Relative weight.	Grains per tolah.	Relative number of grains.
	TOLAHS.			
English	52·5	104	289	83
Punjab	43·5	86	373	107
Beer gánji	50·3	100	348	100
Indigenous	35·3	70	461·5	132

The Punjab barley was thus 14 per cent. lighter per measure than the crop the ryots already have, and it seems useless to make more attempts to introduce that variety. The indigenous barley shows how the crop can degenerate. It is believed to have been introduced many years ago by the late Mr. John Sullivan and the grain is now chiefly husk. The "beer gánji" is believed to be descended from seed introduced not many years ago to obtain locally-grown barley for brewing.

41. The experiments were watched by an Agricultural Inspector belonging to this department for six months of the year and are the first ever carried out in the presidency by the ryots with any attempt at continuous supervision.

42. Regarding other crop experiments, it is impossible at this date to report much, as the district reports have not been received. The following amounts of seed

were sent out during the year, and it has been decided to greatly restrict distribution in the future, it being evident that such experiments as have hitherto been usually conducted have been nearly valueless :—

3	lb. Carolina paddy.	43	lb. Upland cotton seed.
66	„ Red wheat.	40	„ Nankin do.
70	„ White wheat.	20	„ Hinginghaut cotton seed.
1,645	„ English wheat.	1¼	„ Indigo.
175	„ Maize.	13	„ Tobacco of sorts.
77	„ Amber sugar-cane.	2¼	„ Divi-divi.
20	„ Chinese sugar-cane.	340	„ Manilla hemp shoots.
20½	„ Black cholum.	32	„ Guinea-grass roots.
3½	„ and 14 packets of Eucalyptus seed.	1¼	„ Nanal grass seed.
258	„ New Orleans cotton seed.	14¼	oz. Melon seed.

43. As the reports regarding the seeds have not yet been received and cannot be reviewed without delaying this report, I have only to mention a few results which have been submitted since the date of the last report.

From Ganjam it was reported that the Eucalyptus tried at Parlákimedi died off soon after germination. In Salem, as careful experiments as possible appear to have been made with the same plants, but only at Námakal, where the variety is not stated, and at Hosúr with *E. Rostrata* some success was attained, the general failure being attributed to the want of resident agency to attend to the experiments.

Mr. Lee Kirby, of Coonoor, reports that his experience there has been that for "feeding cattle and making hay nothing is so productive as oats, as, if the supply is too large, hay can be made of what is not wanted." As it is probable that the Badagas would find a market for the crop either as a fodder or as a grain crop, it appears very desirable to encourage them to grow it.

Mr. A. Sabapathy Mudaliar, of Bellary, reported during the year the results of his experiments with various varieties of cotton which he had tried in that district, and of all sorts he says that the Broach seed gave the best results, the outturn of cotton-in-seed being nearly double that of the indigenous sort, and of cleaned cotton 30 to 33 per cent. of the kappas to 25 per cent. produced by indigenous sorts, whilst the quality was much superior. These experiments were made in 1882, and have led to a brisk demand for locally-grown seed of this variety, and Mr. Sabapathy Mudaliar estimated that 20,000 acres were sown with the seed last year. It is to be feared, however, that last year's unfavorable season for cotton will much discourage the ryots in taking up this new variety. Mr. Sabapathy Mudaliar concludes by saying that regarding this variety he thinks—

"I. That it is well adapted for the soil of this district and will produce a better crop both in quantity and quality than the indigenous seed.

"II. That to give the best results it requires more moisture and earlier planting, say beginning of August, and that it also requires to be more thinly planted to give it room to spread."

VI.—The improvement of our Live Stock.

44. There is not much to be said under this head this year. The year has been one of waiting for opportunities, which at length came towards the end of the year, after overcoming numerous difficulties. A site has been found and can be secured if Government approve for the stock depôt referred to in paragraph 25 of the last report. It lies not far from Hosúr on the Mysore plateau in the valley of the Poniar, which furnishes it with a supply of perennially flowing water. The country is not rich, nor is the land obtained, but it is hoped that, with the area obtainable, it may be possible to make a good beginning both in cattle and sheep-breeding.

45. As directed by Government, I refrain from entering on any details as to the herd and flock at present owned by the department, but may mention that, on the 1st September last, the following were handed over to the Educational Department for the annexé to the College of Agriculture at Saidápet :—

Cattle.		*Sheep.*	
Cows	2	Rams	2
Calf	1	Ewes	10
Heifer	1	Lambs	10
Young bull	1		
Bulls	3		
Working cattle	2		

At the end of the year the stock belonging to the department sootd as follows :—

Cattle.		*Sheep.*	
Cows	6	Rams	37
Bull	14	Ewes	45
Heifers	5	Gimmers	13
Bulls calves	6	Ram lambs	10
Heifer calves	2	Ewe lambs	8

No serious attack of disease occurred in either the herd or flock during the year.

46. I have not again attempted to collect information as to the stock distributed such as was given in paragraphs 45 to 47 of my last report, and shall only note my observations of such as I personally inspected during the year. In June, I saw the two bulls now in charge of Mr. Little at Karúr, and both were in good condition, and, I hear, continue to do well. In August and again in March, I inspected the stock on the Madura farm; on both occasions the Government bull and rams were looking well, far better than those of the Farmer's Club, but they were doing no good there, as there services were not being utilised in any way. In February I visited the Eurasian settlement at Whitefield and saw the bull sent there last year; he looked well, but perhaps a trifle overfat.

Since the close of the year under report, I have heard of the death of the Aden cow sent to Dr. Shortt in 1885, and also one of the cows sent to the Madura farm.

The Collector of Coimbatore indented, during the year, for an Aden bull, but his wish could not be complied with at the time. Two bulls of that breed were, however, sent up to the Erode show, but, as they did not meet with the approval of the people generally, as far as the Collector could ascertain, they were brought back again.

Two Aden bulls were presented to the Zemindar of Punganúr during the year under the orders of Government. One bull sent to South Canara in October 1885 was omitted from the enumeration made of animals distributed in the last report.

47. The question of the continued retention by Government of the Amrhat Mahal cattle in the Madura district (now in charge of private individuals) came up during the year, and it was recommended that they should be disposed of in the neighbourhood to several gentlemen who promise to allow the services of the bulls free for all cows that may be brought to them. It was not considered worth while to retain the animals pending the opening of stock depôt; as, if it is then desired to breed from the Amrhat Mahal blood, it will be better to go to the original source and obtain fresh animals.

48. Regarding the rams referred to in paragraph 47 of the last report, I can only make the following notes. One of the rams sent to Erode died towards the end of July; those with Mr. Little continue to do well; three sent to the Madura district were found standing at the Madura farm doing nothing, though looking well, at the time of both my inspections.

49. *Fodder.*—The increased supply and the improvement of the quality of this lies to a great extent at the root of the problem of live stock improvement in Southern India. Aside of the questions of breeding from immature and badly-formed animals of both sexes, and of the total neglect of breeding cows in far too many cases, unless adequate supplies of good fodder are to be had at all times of the year, no young stock can develop thoroughly. The influence of food on development is wonderful, and I recently observed a marked instance of it in the Kurnool district. There, in the Cumbum and Márkápur taluks, the soils are generally poor and thin, and the rocks from which they are derived poor also. In these taluks Nellore cattle can rarely reach a live weight of 700 to 800 lb. In the Nandyál valley, on the rich black-cotton soil, the same breed fed on the jonna (*sorghum*) straw grown there, and carefully

tended, develop to weights of fully a 1,000 or 1,200 lb. These are working weights. The value of natural fodder depends to a great extent on the quality of the soil on which it is raised and on its power of furnishing to the plant stores of those materials required to build up the animal frame. Lime is plentiful in the "cotton soil" of the Nandyál valley.

No one who has travelled about the country can help being struck with the enormous quantities of fodder which go to waste annually. In many places there are large areas of waste land producing grass, poor most often it is true, which if cut at the proper time and stored would form a valuable reserve in the hot season, or in times of drought. All along the foot of the Nallamalais in the Nandikótkur and Nandyál taluks of Kurnool are large tracts of open jungle producing large quantities of grass, and thousands of tons go to waste there annually. Why should not this be preserved as a fodder reserve for times of drought and famine, when fodder of any sort rises to a fabulous value, and the want of it destroys thousands on thousands of valuable stock? In some places great stores of hay or silage could be made within easy reach of water carriage (the Kurnool canal) which would enable it to be distributed over a wide area of country, all the way down to Cuddapah, at a small expense.

In such a locality as the above, experiments in the process of ensilage could be conducted with a hope of some valuable results. No one doubts that silage can be made, and made cheaply in India, if adequate supplies of green fodder are forthcoming. It has to be proved whether the process is better or cheaper than making the same fodder into hay, under condition such as we often meet with in this part of India. The comparative value of silage and good hay made from grass of the same quality is still a moot point, and no experiments have, as yet, been started, nor are indeed possible in this part of India which are likely to solve this question. Experiments on a large and extended scale in the making of silage were entrusted to a number of picked officers during the past year, but as yet no results have been received.

50. *Indigenous Breeds of Cattle.*—During the year the Director submitted to Government an abstract of the result of inquiries set on foot in May 1885 regarding the breeds of cattle found in the different districts of the presidency, and the reasons for their degeneracy. The result appears to be that the poor cattle found in so many parts of the country are the result of the use of bad sires, too close interbreeding, and of breeding from immature animals. It also appears probable that the use of paddy straw, as the chief fodder for cattle in some places, results in deterioration in their size. The customary fodder also appears to have some effect on the color as well as on the development and character of the cattle raised in any locality.

It is now proposed to pursue the subject further, and

(i) to procure analyses of the different kinds of fodder commonly used;

(ii) to collect information regarding each taluk of the same description as has already been furnished for whole districts;

(iii) to, as it is now known where special breeds of cattle are to be found, direct the Inspector of Cattle Diseases, when on tour, to visit the localities where they exist, and to draw up a professional description of each breed, taking photographs of typical animals—a work which Mr. Mills has been good enough to offer to attempt.

A series of queries has been prepared and circulated with a view to collecting the information referred to in (ii). These are given in appendix I to this report.

51. I received during the year an interesting inquiry from America where, in the Southern States, Indian cattle are apparently much appreciated by some breeders for their docility, milking and beef-producing qualities, and especially for crossing on the common "scrub" cattle usually raised. What particular Indian breeds have been imported into America is not clear, as all are usually called "Zebus" or "Brahmins," but the fact remains that they are considered to make a good cross on the coarsely-bred cattle so common in many parts of America, which are undoubtedly of European origin. The question of attempting the improvement of our Indian breeds by the reverse process came up during the year, but it was apparently decided that the time for doing this had not yet arrived.

VII.—Miscellaneous.

52. *Collection of Native Implements.*—Nothing has been done in this matter referred to in paragraph 96 of my last report, although proposals as to what could be done were submitted for approval.

53. *Library.*—Steps are being taken for the formation of a library for the use of the department at Chepauk, the inconvenience of having to refer to the library at the Agricultural College having been found too great. It is hoped that many books, the original property of the office of the Superintendent of Government Farms, which were deposited in the College library, may be recovered for the use of the department. During the year the supply of newspapers for the use of the department was largely increased and is now fully adequate. Numerous exchanges from various departments in India, and from public bodies and societies abroad, were added to the library during the year.

54. *Agricultural Sheets.*—The difficulty about the translation of these has been got over, and numerous papers were issued for publication during the year.

55. *Establishment.*—The work of the Agricultural Inspectors has already been referred to. My office has not yet been absorbed in that of the department, and, as far as can be seen, not much saving of labor has been effected by bringing it to Chepauk. There was a very large and natural expansion of clerical work during the year, but it has been entirely departmental, correspondence with the public having dwindled down during the past four years to an infinitesimal amount. Only the addition of the late Saidápet Farm Storekeeper to the clerical force of my office allowed of the work therein being got through at all. During the year the whole of the establishment suffered greatly from its exposure in Kurnool and the continual travelling it had to perform. At the end of the year, of the three clerks on the permanent establishment, only one was present, and he had been absent, owing to fever contracted in Kurnool, for the greater part of the year; the other two were absent owing to ill-health. The peons and lascar attached to the office were nearly worn out in the discharge of their duty and in that respect the establishment is inadequate. The service books of all officers have been written up to the 1st of April.

56. *Finances.*—The following is a summary of the expenditure for agricultural services during the past three years; details will be found in appendix II:—

Items.	1884-85.	1885-86.	1886-87.
Receipts—	Rs.	Rs.	Rs.
Provincial grant	2,000	2,000	2,000
Surplus Pound Fund	32,318	42,311	..
Departmental receipts	4,387	3,623	3,183
Total ..	38,705	47,934	5,183
Expenditure—			
General charges	15,374	13,399	14,385
Saidápet Experimental Farm	7,483	4,918	1,704
Estate charges and improvements	1,283	77	..
District operations	2,644	5,501	7,023
District analyses	..	..	5,354
Stock-breeding	..	..	787
Pony-breeding	..	692	5,261
Cattle-disease inspection	28,008	33,623	39,418
Total ..	54,792	58,210	73,932

It will be seen that the receipts on account of the Saidápet farm and the live stock of the department were considerable, partly owing to the selling off of condemned and useless stock on the closing of the Saidápet farm. The growth of expenditure is almost entirely due to the development of the veterinary branch of the department. The heavy charges under district operations were caused chiefly by the purchase of seed, wheat and barely for experiment on the Nílgiris. The sum debited to the Saidápet farm is really chargeable to stock-breeding.

The charges incurred on behalf of exhibitions are not shown in this statement, as they are met by a special provincial grant for the purpose.

No mention has been made in this report of the pony-breeding operations in Coimbatore and Salem, as they are at present under the joint supervision of Mr. Mills and the Collectors.

APPENDIX I.

MEMORANDUM OF POINTS ON WHICH INFORMATION IS BEING COLLECTED REGARDING CATTLE.

I.—The Cattle bred in each Taluk.

1. Are there any distinct breeds? If so, by what names are they known and in what parts of the taluk are they bred?

2. What is the
   - (*a*) character,
   - (*b*) size,
   - (*c*) color,

by which the several breeds are distinguished?

3. Are the cattle good
   - (*a*) for draught purposes, or
   - (*b*) as milch cattle?

4. If for draught purposes, are they suitable for fast or slow work?

5. Are the breeding stock dependent on
   - (*a*) grazing, or
   - (*b*) other fodders?

6. If other fodders are used, what is the commonest, and when is it supplied?

7. Is any, and what, extra food given to
   - (*a*) tilling cattle,
   - (*b*) draught cattle,
   - (*c*) cows,
   - (*d*) young stock?

8. (*a*) Is any care bestowed in the selection of bulls for breeding?
   (*b*) If not, is any control exercised over breeding?
   (*c*) At what age are young bulls castrated, and how?

9. Is any shelter provided for cattle? If so, what is its character and for what class of stock is it provided?

10. (*a*) At what season of the year are calves annually dropped?
    (*b*) For how many years, and how frequently, do cows usually drop calves?
    (*c*) After the calving season, is the supply of pasture or other fodders usually sufficient?

11. (*a*) Are cows usually milked?
    (*b*) If so, how much do they yield daily, and for how long after calving?

12. (*a*) Are cattle extensively exported?
    (*b*) If so, at what age?
    (*c*) To what place or places?
    (*d*) By whom is the trade carried on?
    - (*a*) By local dealers, or
    - (*b*) By dealers from a distance?

13. What is the local value of
    - (*a*) a draught bullock?
    - (*b*) breeding cow?
    - (*c*) young stock when sold by dealers?

14. Make also any general remarks which may strike you regarding the causes of the degeneracy, if any, of the stock, and the practices of breeders. Also note the views of experienced breeders and ryots as to the cause of degeneracy.

II.—Imported Cattle.

1. Are any cattle imported into the taluk, and to what extent?
2. Of what breeds are they, and in what parts of the taluks are they found?
3. Are they suitable for
   - (*a*) draught, or
   - (*b*) dairy purposes?
4. Whence are they imported and by whom, and at what time of the year?

5. (*a*) Are there any local cattle fairs held? If so, when and where?
(*b*) What breeds of cattle, and how many of them are brought for sale there?
(*c*) Whence are they brought?

MADRAS,
25th January 1887.

(Signed) C. BENSON, M.R.A.C.,
Assistant Director of Agriculture.

APPENDIX II.

STATEMENT OF ACCOUNT FOR AGRICULTURAL SERVICES DURING 1886-87.

				RS.	A.	P.
I. General charges—						
Establishments			10,776 4 5			
Travelling charges			2,677 2 6			
Contingencies			931 7 3			
				14,384	14	2
II. Saidápet Experimental Farm—						
Cooly labor			691 13 10			
Implements and machines			42 2 4			
Live stock			930 12 8			
Seeds			13 0 0			
Manures			4 8 0			
Contingencies			21 11 3			
				1,704	0	1
III. District operations—						
Exhibition of improved ploughs			417 3 10			
Improvement of agriculture and trade			5,158 7 0			
Distribution of seeds			447 9 2			
Madura Farm Superintendent			600 0 0			
Do. petty constructions and repairs			400 0 0			
				7,023	4	0
IV. District analyses—						
Agricultural inspectors			2,798 0 0			
District analyses clerks			1,740 0 0			
Travelling charges			739 14 6			
Contingencies			75 11 9			
				5,353	10	3
V. Stock-breeding—						
Maintenance of herd				786	13	7
VI. Pony-breeding				5,261	1	3
VII. Cattle-disease inspection				39,417	14	0
		Grand Total		73,931	9	4
Income—						
Saidápet Experimental Farm—						
Farm produce			1,169 10 6			
Implements and machines			612 8 0			
Sale of live stock and produce, &c.			749 8 10			
Sundries and recoveries			104 4 8			
				2,636	0	0
Surplus Pound Fund						
Grant for improvement of agriculture and trade				2,000	0	0
Cattle-disease inspection				546	9	3
		Grand Total		5,182	9	3

MADRAS,
10th June 1887.

(Signed) C. BENSON, M.R.A.C.,
Asst. Commr. of Land Records and Agri.

To the Commissioner of Revenue Settlement, Land Records and Agriculture.

MEMORANDUM.

In continuation of paragraph 31 of my annual report, I submit the following in reference to report received from the Madura Farmer's Club regarding the work of the farm in 1886-87.

2. *Financial.*—I annex statement showing the receipts and expenditure of the farm for the past two years, from which it will be seen that the net farm income for the two years was Rs. 499-1-2; but some of the expenditure during the period was debitable properly to capital, and, without valuation statements at the beginning and end of the period, as well as statements of liabilities and assets, no complete statement of account can be made out.

3. During the same period the Farmer's Club received Rs. 5,330-2-2 from outside sources and expended the following sums:—

	Rs.	A.	P.
Agricultural exhibition	1,028	0	0
Buildings	1,905	4	2

so that Rs. 2,396-14-1 should have been added to their funds during the period in addition to the sum realised from the farm. Of the condition of the funded capital of the Club, I have no knowledge, and it does not concern this department.

4. *Season and Crops.*—The report furnished does not add much on this subject to what I noted in my annual report. The season was very unfavorable. The total area planted or sown with crop was 41·13 acres, of which 7·72 acres failed, 13·55 acres of horse-gram were ploughed in and 5·01 acres were standing at the close of the year, so that only 15·85 acres of crop sown were successfully harvested during the year. The report, however, shows the following areas to have been harvested:—

	Acs.		Yielding per acre.
Fodder crops	6·32	11,652	lb. green fodder.
Paddy	1·36	724	„ grain and 2,500 lb. straw.
Maize	·48	161	„ grain and 4,608 lb. straw.
Cholum	4·86	239	„ grain and 6,753 lb. straw.
N. O. Cotton	1·	718·5	„ cotton-in-seed = 225 lb. lint.
Nankin cotton	·40	79	„ cotton-in-seed.
Tobacco	2·27	605½	„ cured leaf.

Barley, exotic tobacco, and divi-divi were also experimented with; the two first without success, but the divi-divi plants are promising and arrangements are being made to test the pods in local tanneries.

5. The only crop of any peculiar interest is the tobacco. In this case a native variety called *Usikappal* was grown, which is regarded as one of the best grown in the Madura district, and with the produce various drying experiments were tried as follows:—

The experiments were begun on the 8th January last when three sections of the crop were cut and treated as shown below:—

No. 1.	No. 2.	No. 3.
Cut at 4 P.M., left on the field till next morning, carried to shed before 7 A.M., and the whole plants hung in rows 2 feet apart. The plants were reversed daily and hung in all for 20 days. The shed was very open and the weather dry, with heavy dews in the mornings. On the 28th January the plants were taken down and heaped for fermentation, which process was continued for 23 days, the heaps being turned five times. The leaves were then stripped from the stems, tied in bundles of about 1 lb. weight each, and again bulked for 18 days, during which period they were turned four times.	Cut as No. 1, and left on the field for 3 days according to the native practice. Then hung in rows in the sun for 16 days and then bulked under cover for 25 days with 5 turnings. The leaves were then stripped and again bulked for 14 days with 4 turnings.	After cutting as No. 1, the leaves were stripped from the stems at once, taken to the shed and hung in rows. These rows were daily turned. In 16 days the leaves were dry and were taken down, tied in bundles and bulked. The leaves were then a pale green. Fermentation was continued for 34 days, the heap being turned 9 times.
The leaf is reported to have a mild flavor.	Flavor said to have been strong.	Flavor said not to be very strong.

Samples of the leaf have been forwarded, and I recommend that a professional opinion be obtained on the bulk. No details have been furnished as to any sales.

6. *Live Stock.*—The outbreak of foot-and-mouth disease caused a good deal of trouble amongst the cattle, but no deaths, although one of the Government Aden cows has since died from debility, probably resulting from the attack.

The Amrhat Mahal bull died on the 3rd April 1886 and one cow was lost during the year. The health of the sheep flock was very bad, 30 having died out of a flock of 199, and 144 were sold to reduce the stock. The milking cows and working cattle get a fair ration of artificial food; but dry cows, young stock, and calves for a considerable portion of the year got nothing besides their fodder. The sheep had to trust to grazing entirely.

7. The experiments in feeding dairying cattle are summarised in the following table. Begun in July 1886, they were suspended and resumed again in January :—

		Milk, total.	Butter, total.	Per measure of milk.	Ghee, total.	Per lb. of butter.	Food per head.	Remarks.
		M. O.	LB. OZ.	OZ.	LB. OZ.	OZ.		
July 1886 ..	2 Cows ..	72 6½	15 4¼	3·4	9 11½	10·1	High ration— 4 lb. cake, 2 measures dholl husk. 1 lb. rice bran and 1½ oz. salt. 40 lb. green fodder and grazing for 7 hours on guinea grass.	Calves about 8 months old.
	1 Buffalo.	47 0	18 13½	6·4	13 6¼	11·4		
January and February 1887.	2 Cows ..	222 4	38 0½	2·7	22 4¾	9·4	Low ration— 2 lb. cake, ½ lb. rice bran. 2 measures dholl husk, ¼ oz. salt. 20 lb. straw, grazed 7 hours.	Calves about 14 days old at commencement.
	1 Buffalo.	125 2	33 6¼	4·3	20 2½	9 6		
March and April 1887.	2 Cows ..	204 3	43 9	3·4	24 14	9·1	High ration— 4 lb. cake, 1 lb. rice bran. 2 measures dholl husk, 1½ oz. salt. 40 lb. paddy straw; grazed for 7 hours.	The same cows as were fed on low ration in January and February.
	1 Buffalo.	89 0	26 5½	4·7	15 15	9·7		

The results recorded in July show that under similar conditions buffalo milk yielded nearly double the quantity of butter given by cow's milk, and that this butter also contained more ghee. The further results obtained later in the year are somewhat similar, but apparently the buffalo cow required richer food to give such a proportionately high outturn of butter and ghee than was fed to her in January and February, whilst on return to liberal food in March and April she did not show the same recovery in quality of milk as the cows. The low feeding of the cows after calving, as might be expected, permanently affected their yield of milk. One of the cows experimented with was an Aden and the other an ordinary country cow, and the milk of the former throughout was at least 15 per cent. richer in butter than that of the latter.

During the year the cows on the farm gave milk as follows :—

Breed of cows.	Average milking period.	Average yield. Total.	Average yield. Daily.
		MRS.	MRS. OLL.
3 Adens	279 days	546·3	2 0
13 Country cows ..	239 ,, ...	328	1 2
4 Buffaloes .. .	339 ,, ...	522·7	1 4

It will be noted that the buffalo cows gave milk for nearly a year after dropping their calves, but their total yield was less in that long period than that of the Adens. The latter gave the best daily record and the milking periods were of good length, whilst the intervals before they again began to yield milk only averaged fifty days. The ordinary native cows gave a lower daily record even than the buffaloes, for the shortest period of either, and in the case of six the interval during which they were dry averaged 152 days. None of the average or total yields are remarkable, though that of the Adens is fair for the period. The yield is in each case noted in Madras measures of 8 ollocks or 100 cubic inches each.

8. The 2 Aden bulls standing on the farm served—one 19 cows, of which 17 successfully, and the other 4 cows, of which 3 successfully. These results are not at all satisfactory, and it is evident, as I pointed out to the Director in August last, that one of the bulls is doing no good on the farm. He was sent to the Madura district to be used under the Collector's orders. The same remark applies to four rams also standing at the farm.

9. It is reported that the Beheea sugar mill and several other machines and implements have been exhibited in the town during the principal festivals. The American sickle has been found to be much superior to that in common use, and is appreciated by the coolies. Double mhotes are in constant use on the farm, and an experiment was made in the use of steam power for raising water, but the cost of fuel was found to be prohibitive.

STATEMENT OF ACCOUNTS of the Madura Farm for the years 1885-86 and 1886-87.

	RECEIPTS.			CHARGES	
	From farm.	From other sources.		Of farm current.	For other purposes.
1885-86.	RS. A. P.	RS. A. P.	1885-86.	RS. A. P.	RS. A. P.
Live stock	1,194 15 8	..	Live stock	593 10 0	..
Farm produce	257 1 7	..	Manure	19 1 4	..
Implements	35 1 0	..	Seeds	4 9 0	..
Sundries	758 9 7	..	Labor	748 7 3	..
Subscriptions and donations	..	3,672 14 0	Implements	64 14 9	..
			Repairs	34 9 8	..
			Sundries	25 11 7	..
			Exhibition	..	1,028 0 0
			Buildings	..	368 10 8
			* Do. unsettled advance ..	..	1,000 0 0
Total for the year ..	2,245 11 10	3,672 14 0	Total for the year ..	1,490 15 7	2,396 10 8
1886-87.			1886-87.		
Live stock	1,765 3 5	..	Live stock	985 13 1	..
Farm produce	72 5 11	..	Manure	1 1 6	..
Labor	163 11 6	..	Seeds	33 3 2	..
Sundries	130 11 0	..	Labor	750 9 5	..
Interest	..	757 4 3	Implements	321 15 9	..
Government contribution for exhibition held in 1885-86	..	500 0 0	Sundries	118 6 9	..
Do. for tobacco shed..	..	400 0 0	Repairs	176 9 3	..
			Buildings, viz., tobacco shed and store-room ..	..	536 9 6
Total for the year..	2,131 15 10	1,657 4 3	Total for the year ..	2,387 10 11	536 9 6
Grand Total ..	4,377 11 8	5,330 2 3	Grand Total ..	3,878 10 6	2,933 4 2
			Net farm income for two years	499 1 2	..
			* Net capital to be accounted for	..	2,396 14 1
	4,377 11 8	5,330 2 3		4,377 11 8	5,330 2 3

* Neither of these sums have been accounted for, nor have we any information as to the further liabilities of the farm.

ANNUAL REPORT OF THE INSPECTOR OF CATTLE DISEASES.

The three probationers remaining under training last year have been promoted to the grade of local inspectors. Two probationers were admitted, one was requested to resign and the other is still under training. The strength of the department on the 31st March 1887 was as follows:—

Inspector	1
Deputy Inspector	1
Local Inspectors	18
Probationer	1
Total ...	21

2. Local Inspector M. Bhavani Shunker Row resigned, Local Inspector M. Narrayan Row was transferred to the Educational Department as third Assistant at the College of Agriculture, and Local Inspector M. Swernalinga Naicker was dismissed. B. Venkata Dasapah, a Mysore State Veterinary student, was given a direct appointment.

3. *Inspections.*—G.O., No. 3881, Revenue, dated 1st July 1886, gave me from 1st July to 31st December for mofussil inspection during which time I visited the district of Coimbatore (twice), Tanjore, South Arcot, Bellary, Anantapur, Kurnool, Cuddapah, Malabar and South Canara.

4. *Deputy Inspector.*—On Mr. Shunker, the Deputy Inspector, resuming work after his leave on the 5th July, he was permanently posted to take immediate charge of the pony-breeding operations in the Coimbatore district, where he worked until 25th January 1887. He was then transferred to the Salem district to look after pony-breeding and castration there. He proceeded to Bombay on the 8th December 1886 for the purpose of purchasing stallions for Government and returned on the 24th December 1886.

5. *Local Inspectors.*—The local inspectors have, with the exception of one or two, given me satisfaction.

6. *Probationers.*—The probationer now undergoing training has up to date done well. For number of inspections made and districts visited, see appendix No. 1.

7. *Hospital.*—Farrier Havildar Fernandez, who was in charge of the hospital, was transferred back to his regiment on the 1st June 1886, and Mr. Borthwick, from His Highness the Maharajah of Mysore's Breeding establishment, was entertained to fill his place, and has given every satisfaction.

8. The admissions to the hospital during the year amounted to 198 as against 339 in the previous year, showing a falling off of 141 cases; this I can only account for owing to my prolonged absence from head-quarters on tour, viz., six months, and to the fact that no serious outbreaks of disease occurred in the vicinity of the hospital or on the farm as was the case last year. The percentage of deaths on admissions was 11·61 or 0·87 less than in the previous year.

9. Seven castrations were performed, all of which were successful. A case of traumatic tetanus was successfully treated. The hospital buffalo died from the bite of a cobra.

For particulars of admissions, &c., see appendix No. 2.

10. *Act No. IV of* 1879.—No animals were admitted under this Act.

11. *Pharmacy.*—Twelve thousand five hundred and twenty prepared doses of medicines were despatched to the districts as against 7,318 in last year, in addition to a large quantity of drugs in bulk, besides disinfectants. The medicine supplied by the department continues to give every satisfaction.

12. *Office.*—The work of the office continues to be very heavy and increases year by year.

13. *Financial Statement.*—The estimated budget grant for the official year 1886-87 was Rs. 37,800, expenditure Rs. 38,639-15-4; the sum of Rs. 839-15-4 were spent in excess of the grant.

14. The receipts on account of treatment of cases, &c., have been Rs. 546-9-3 as against Rs. 562-14-9 in the previous year, a decrease of Rs. 16-5-6.

For particulars of expenditure, &c., see appendix No. 3.

15. *Educational.*—The students at the College of Agriculture have done fairly well. A dissecting-room has not yet been supplied for the use of the students.

16. *State Students.*—The student from Travencore still continues his studies. The Vizianagrum student after undergoing one year's training has gone home.

17. *Salustries.*—Two Mahomedans were sent by the Transport department for the purpose of being trained as salustries. One of the men has turned out very well indeed, but the other was found unsuitable and was requested to leave.

18. *Protective inoculation for Anthrax.*—No further experiments have been conducted as I consider all that could be done has been done by this department, and until a local laboratory has been established for the manufacture of a safe and reliable anthracine, no more steps in the matter are, in my opinion, necessary.

19. *Pony-breeding.*—The number of coverings for the year by all the stallions, both in the Coimbatore and Salem districts, amounts to 101.

20. The number of foals dropped were 11—10 in Coimbatore and 1 in the Nílgiris. Seven were got by the late stallion "Mahadi", and 4 by "Parfait Amour." Peculiar to say no less than 9 out of the 11 foals are fillies.

21. *Castration.*—Mr. Shunker, the Deputy Inspector, has castrated during the year 83 ponies, and not a single death has occurred, which is most satisfactory. The people are reported to be taking well to this new scheme of castration, which is a favorable sign, as it lies at the root of scientific pony-breeding and must in time show good results by the weeding out of worthless sires.

22. *Agricultural Exhibition.*—At the end of March I attended the Gooty Agricultural Exhibition in my capacity as Inspector of Cattle Diseases and as a judge of ponies and cattle.

23. *Section A, Group I.*—Thirteen animals were exhibited under this group—1 galloway stallion, 6 pony stallions, 1 pony gelding, 3 pony mares, 1 mule and 1 ass stallion. Taken as a whole, they were by no means a good lot, and the only prizes which were awarded were 1st prize for galloways, a 2nd and a special prize for ponies. The mule got a special prize and the ass stallion 2nd prize.

24. The mule was a good specimen, out of a very fairly made country bred bay mare, got by one of the Government stallion asses, but which one I failed to find out from the owner. He belonged to Rámallakót taluk, of the Kurnool district, so, I presume, it must have been "Guznee." Be that as it may, the mule will in about another year make a capital transport animal. He was sound and well put together.

25. *Group II—Bulls.*—The stock under this group were a grand show—bulls, Nellore breed, 45; other breeds, 35. Better bulls could not be wished for than most of the Nellores exhibited, but there were many points they would stand improvement in; notably the feet are much too small for such large superstructures; this was shown in many cases by their arriving at the show foot-sore and dead-lame; they are also deficient in rib, and narrow across the pelvis; the hocks too are short, flat and weak; in fact, the shortness of the os calcis in several animals almost amounted to a deformity, all defects which might in time be rectified by judicious breeding. It could be particularly noticed that, although there was hardly a fault to find with the imposing head and fore-quarters of these fine bulls, still there was always a feeling of disappointment when one began to scan them behind the hump.

26. *Other Breeds.*—Some of these bulls were fair specimens, but were much smaller and not up to anything like the Nellores.

27. *Cows and Heifers.*—Twenty-one were shown, all of the Nellore breed, and with only a few exceptions, all came from the Ongole taluk. I cannot speak too highly of them, as all round they were an excellent lot; in fact, it was a most difficult matter to award prizes. Taking the points of these cows and heifers into consideration, I certainly think they showed up much better than the bulls; some of them, especially

a red four-year old cow which took 1st prize, a better formed cow for dairy purposes it would be hard to find anywhere; she was broad and roomy with a big well-filled and well-formed udder. The heifers were equally as good as the cows.

28. Amongst the exhibits there was a sheep with six legs, four were in the normal position, but the two extra ones were attached to the integument of the sternum or breast-bone. They performed no functions whatever, *i.e.*, they did not assist or interfere in any way with locomotion.

29. Another freak of nature which I noticed was a hermaphrodite sheep. The male functions seemed to be complete, but the female was only rudimentary and imperfect.

30. *Purchasing Ponies.*—In September I was employed on special duty in purchasing ponies for Burmah.

Cattle-poisoning.

31. Having directed all local inspectors to specially mention cattle-poisoning in their annual reports, I append the information received up to date.

32. I beg to point out that during the official year 1885-86 seventeen cases of cattle-poisoning were included in the district statistics submitted to this office, whereas I find on reference to the report of the Chemical Examiner for the same year that 112 cases were reported to his office which clearly proves that the statistics sent to this office are of little value.

33. *Anantapur.*—"A case of cattle-poisoning was brought to my notice on the evening of the 9th May 1886 from the village of Tadpatri, to which place I proceeded at once and made inquiry about the nature and mode of how they have administered the poison to the animal. The owner expressed his entire ignorance of the matter. I observed the animal protruding its tongue, keeping its mouth wide open and moaning bitterly. No other symptoms were visible than these." The case was successfully treated by the inspector.

34 *Arcot, South.*—"During the official year under report thirteen animals belonging to the people of Maseemanathum, in the Chidambaram taluk, have been poisoned by white arsenic, of which nine succumbed to the effects of the poison and the remaining four are said to have recovered. This practice was commenced by some Pariahs of the surrounding villages who had, I learnt on inquiry, previously entered into a contract with a certain hide merchant living somewhere in the taluk, and who it is reported by the people at large keeps with him an inexhaustible store of the said poison for the purpose of supplying these chucklers. The latter receiving the poison came towards the village in the month of August 1886, and with the assistance of that village toties and certain cow-boys began their inhuman practice. The method adopted by them in giving the poison is to mix it with some flour and water so as to reduce it to the consistence of a paste and rub it on Portia leaves (Pooarasu, *Tam.*) which are rolled and given to the animals by the mouth during the night-time. This is done, of course, by their stealing into the cattle-sheds and administering the poison with the forced consent and assistance of the cow-boys. The animals generally die by the next morning. When some animals died like this, the owners began to inquire into the cause of the sudden deaths among their cattle, there being no disease of any kind at the time, and those animals being, I was told, found completely healthy when brought home the night previous to their death. The clue was found out by the assistance of a cow-boy of a ryot by name Thambusami Oodayar of the village, and then they began to try some antidote which they knew. By this means they declared that they have succeeded in restoring the four animals previously mentioned to health. Then the matter was reported to the village officers, who in their turn brought the same to the notice of the Police officers. In their inquiry it was said to have been clearly proved that these cattle did really die from the effects of poison, the culprits themselves having come forward and confessed that they were the sole cause of this mischief. Further, in their search of the culprits' house a few doses of the poison were found and which were produced by them before the Magistrate as clear evidence. These doses of poison were transmitted by the Magistrate through the medical authorities to the Chemical Examiner to Government, and the latter after a careful examination

writes to say that a considerable quantity of white arsenic has been found in each substance. This case is now pending in the Head Assistant Magistrate's Court."

35. *Canara, South.*—"Every inquiry was instituted with a view to find this out, and as yet I have not come across even one case of criminal poisoning."

36. *Coimbatore.*—"No cases came under his notice during this official year."

37. *Kistna.*—The practice of criminal poisoning does not seem to exist in the district."

38. *Godávari.*—"Cattle-poisoning does not exist."

39. *Ganjam.*—The local inspector under date of 18th September 1886 reports—"The deputy tahsildar of Sómpet mentioned in his season report that 132 animals have died of poisoning in Sómpet."

He went at once to investigate the matter and discovered after analysis that the poison used was some form of arsenic which the following report will show:—

"I proceeded to Sómpet and on inquiring of the deputy tahsildar about the cattle-poisoning, he said that the police had found out a case and sent the supposed poison to the apothecary in charge of Sómpet dispensary. The Senior Assistant Collector, who was then here, ordered the apothecary to help me in supplying all the necessaries that could be obtained from the dispensary for analysis. The apothecary handed over to me a packet containing some white stuff together with some semi-masticated leaves of grass for analysis, and also he informed me that he had tried a little quantity from the packet on a chicken *and that the result was fatal.*

"I analysed the stuff in the presence of the apothecary and found out that it contained some arsenic, which no doubt would kill any animal, and gave a certificate to that effect. The guilty persons have been punished with *six months' rigorous imprisonment.* Not a single death occurred since my arrival here. I have made inquiries in the adjacent villages and the people gave a history of previous deaths, *i.e.*, before my arrival here; but there are none now. In many of the villages I hear that the zemindars in this taluk are in the habit of giving contracts to some merchants every year for a certain sum, giving them sole power to collect all the hides in their dominions; and even if the people object to give them, it seems the zemindars force them to do so.

"The contractors in their turn nominate one are two chucklers in each village, or in two or three villages together, to collect all the hides on certain conditions. The larger number of hides they collect the more they will be profited, and whenever the number falls short, these chucklers for their own benefit may try to poison as many cattle as possible. The accused in the Sómpet case is a contractor. So I think that this contract system may be the cause of outbreaks of cattle-poisoning in these parts, and therefore request you will be kind enough to take some measures to prevent it."

Tests he employed.—"I prepared a solution from the contents of the packet—

(1) "I took a little of the solution in a test tube and added to it ammonio-nitrate of silver, which gave a yellow precipitate and was dissolved in excess of ammonia and nitric acid.

(2) "I took a small quantity of the solution in another test tube and added to it ammonia and sulphate of copper solution which gave a precipitate of schulis green.

(3) "I took a clean bottle, fitted to it a thin quill tubing, put some granulated zinc pieces (pure) and sulphuric acid with a small quantity of the solution into the bottle and corked it when gass issued through the tube. I lighted a match at the mouth of the tube which gave a greyish violet flame, then I took a piece of clean paper and moistened it with ammonio-nitrate of silver solution, and held it over the flame, which gave a yellow stain.

(4) "I put a little of the powder (from the packet) over the fire which gave a garlic-like smell."

40. *Kurnool.*—"Has met with no cases of cattle poisoning."

41. *Madura.*—"No cases of cattle-poisoning have been brought to my notice since I joined the district (11th November 1886)."

42. *Malabar.*—"Cases of cattle-poisoning occurred in different parts, but it was difficult to detect them, as the matter came to notice a long time after the disposal of the carcasses."

43. *Nilgiris.*—"Cases of this nature have not come under my notice."

44. *Nellore.*—From the information received at different places during my tour, criminal poisoning is carried on to some extent by chucklers. Only two cases were registered in a village in Rápúr taluk in last September, and how many were left

unregistered in other places I cannot account for. Investigations were made by me to detect the culprit or culprits, but it was impossible to do so, as the villagers never lay any suspicions on the chucklers or Pariahs belonging to their own village."

45. *Vizagapatam.*—"This nefarious practice of poisoning cattle for the sake of their hides by Chammers does no doubt exist to some extent in this district, although no confirmed case has come under my notice. Suspicion was entertained in the village of Nindugonda, of Golgonda taluk, where about eight head of cattle were reported to have died within 48 hours of the attack, which, as far as I could judge from the statement of the curnam, could not be satisfactorily identified with any known contagious disease. There was, however, no evidence whatever to show that the cattle were criminally poisoned. Further, no carcass was available for my examination at the time I visited the village and no further case was reported."

46. *Spreading Contagion.*—The common practice of spreading contagion by chucklers cutting up carcasses in exposed places has been taken notice of in South Canara, where a conviction was obtained, copy of which is attached.* It would be well if such prosecutions were more frequent, as nothing better for the spread of disease can be imagined than the reckless way diseased carcasses are cut up where animals have free access.

ST. THOMAS' MOUNT, 1st May 1887. (Signed) J. MILLS, Vety. Surgn., 1st class, Inspector of Cattle Diseases.

ORDER—dated 25th October 1887, No. 1012, Revenue.

Miscellaneous.

In accordance with the instructions contained in Circular No. 52-G—69-6, dated 14th September 1887, of the Government of India, Department of Revenue and Agriculture, Government do not propose to review the report read above at length, and will merely pass such orders as may seem necessary.

2. His Excellency the Governor in Council agrees with the Board that there ought to be no difficulty in training an Agricultural Inspector to take charge of a travelling show of agricultural implements.

3. The results of the experiments with seed distributed among the districts are discouraging, and the Board should consider whether it would not be advisable in future to entrust experiments of this nature only to such officers as are likely to take an interest in them.

4. No less than 50 per cent. of the cattle attacked with disease during the year died, but neither the Board nor the Inspector of Cattle Diseases have noticed this very large increase in the proportion of deaths to attacks. Nor does the report contain any

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* *Calendar Case No.* 23 *of* 1887.

Regina et India Imperatrix *v.* (1) Keraga, (2) Sinna Keraga, (3) Guruva, (4) Aita.

Offence.—Negligent act likely to spread infection of disease dangerous to life, section 269, Indian Penal Code.

Finding.—Guilty.

Sentence.—Defendants each to suffer to 10 days' simple imprisonment.

JUDGMENT.

The Bantvál police charges the abovenamed persons under section 269, Indian Penal Code, because they opened a carcass of a cow died of rinderpest in a public place, and took away a portion of the meat for their own use, leaving in the spot all rubbish.

The accused admit having opened the carcass in an open place, viz., a paddy field, and taken a portion of the meat for their own use. But they say that they did not know that the animal died of rinderpest. They have no witness to examine on their behalf.

I have examined the three witnesses out of five cited by the police. First witness, Achuta Baliga, says that before giving the carcass to the accused to be buried, he had informed them that the animal had died of rinderpest. Second witness, Potel Manjinath Phrabu, states that he has expressly told the accused and the other Pariahs of the place not to use the meat of the animals died of cattle disease, but to bury the carcass. Third witness, Mr. Santayya, Cattle-disease Inspector, has seen the accused opening the carcass in an open place which is used by the cattle to graze.

Rinderpest is a contagious disease and the meat of the animal died of that disease is dangerous to the health of the persons using it.

The accused have committed an offence either under section 269, Indian Penal Code, or under section 291, Indian Penal Code, and I order that defendants should each undergo 10 days' simple imprisonment for the same.

BANTVAL, 5th February 1887. (Signed) V. RAMA ROW, Second-class Magistrate.

information regarding the efforts made by local Inspectors to cope with outbreaks of disease. Even the usual returns showing particulars for each district have not been forwarded this year. It is therefore impossible for the Government to form any opinion upon the working of this most important branch of the Agricultural Department. These omissions should be supplied in future reports. Government also desire to impress upon the Commissioner that it rests with him, as head of the department, to see that the local Inspectors do their work efficiently: he can only do this by the exercise of careful and constant supervision.

5. It is to be hoped that the introduction of the new village manual will result in securing greater accuracy in the returns of cattle. This, however, must not be left to chance, but district officers must frequently test the statements submitted by the village accountants, for it is only by constant check that accuracy can be ensured.

6. The experiment in stock, pony-breeding and ensilage should have the continued and close attention of the Commissioner.

7. The matter of the large number of cases of cattle-poisoning which occurred in the Anantapur district should form the subject of further inquiry, and the local Cattle Diseases Inspector of that district should be specially warned to promptly bring before the Magistracy any cases of this nature that may come to his notice.

8. The greater part of Mr. C. Benson's time appears to have been devoted to the preparation of the analysis of the Kurnool district. Apart from this, he supervised two agricultural shows and one travelling exhibition of agricultural implements; he visited the Karúr and Madura farms and the settlement at Whitefield; and he inspected two localities proposed as sites for a stock depôt. It will be seen that unless his duties in connection with the Kurnool analysis were very heavy, the work in his particular branch of the department is far from onerous. The results of the Kurnool analysis have not yet been submitted to Government, so they are not at present in a position to judge whether Mr. Benson's time was fully occupied or not; but as the district analysis work will be much lighter in future, they are unable to concur in that officer's opinion that it is "very evident that the growing work of the department is more than one officer can properly attend to."

(True Extract.)

(Signed) J. F. PRICE,
Ag. Secretary to Government.

To the Commissioner of Revenue Settlement, Land Records and Agriculture.
" Commissioners of Land Revenue.
" Government Botanist.
" Editors' Table.

No. 1012-A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) J. F. PRICE,
Ag. Secretary to Government.

RESOLUTION—dated 24th December 1887, No. 537.

Communicated to the Inspector of Cattle Diseases and to all Collectors whose attention is called to paragraph 5 of the Government Order.

2. The Collector of Anantapur is requested to report on the subject of paragraph 7 of the order and to issue the necessary instructions to his local Cattle Disease Inspector.

3. The instructions in paragraph 3 of the order have already been followed to a great extent during the current year.

4. With reference to paragraph 4 of the order, the Board beg to state that in previous years the statistics of cattle diseases and mortality furnished in the Director's report were obtained from returns compiled by the Inspector of Cattle Diseases. In

the year under review an attempt was made to check these returns with the figures given in the Collectors' administration reports for 1886-87 and it was found that the statistics were wholly unreliable. According to Mr. Mills' returns the total number of deaths of cattle from all causes was 144,160, while according to the Collectors' administration reports it was 287,204. Differences were observed in every district and the Board thought it useless to give any details for districts under such circumstances. In the current year the local Cattle Disease Inspectors have been placed under the immediate orders of Collectors, and arrangements have been made for the compilation of the statistics in the Board's office instead of in that of the Inspector of Cattle Diseases. The local Inspectors are now carefully supervised in most of the districts and their movements are reported to the Board every week in a footnote appended to the post copy of the weekly season reports sent by Collectors. It seems hopeless, however, to expect that one local Inspector with a whole district as his range will be able to cope successfully with outbreaks of cattle diseases in different parts of the district.

(A true Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

(True Copy.)

(Signed) M. ADINARAYANA IYAH,
First Assistant.

To the Secretary to Government, Revenue Department.
„ all Collectors.
„ the Inspector of Cattle Diseases.

Exd. W. J. Lewis.

REPORT

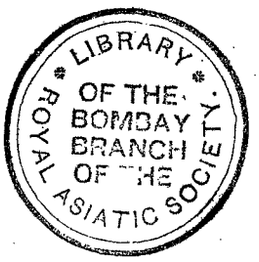
ON THE

OPERATIONS OF THE AGRICULTURAL DEPARTMENT,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1887-88.



MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1889.

PROCEEDINGS OF THE BOARD OF REVENUE

(REVENUE SETTEMENT, LAND RECORDS AND AGRICULUURE).

READ—the following G.O., dated 18th December 1888, Nos. 872, 872A, Revenue:—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 16th August 1888, No. 422:—

W. WILSON, ESQ., M.A., C.S.

Resolution—dated 16th August 1888, No. 422.

The Board resolve to submit to Government their report on the operations of the Department of Land Records and Agriculture during the year ending 31st March 1888.

2. The most important change effected during the year was the reorganisation of the Board of Revenue, under which a Member of the Board was made Director of the Department of (Revenue Settlement) Land Records and Agriculture. The change was carried out from 1st April 1887. From that date to 3rd July 1887, the Hon'ble Mr. Whiteside was Director as Acting 3rd Member. He was succeeded by Mr. Grose. Proposals were submitted for remodelling and strengthening the superior staff of the department, but Government considered that, for the present, the only addition to the staff that was required was a Sub-Assistant Director of Agriculture, who would work ordinarily under the Inspector of Cattle Diseases; but during the absence on leave of the Assistant Director of Agriculture, or at the time of agricultural shows, could be otherwise employed at the discretion of the Director.

I.—ORGANISATION AND MAINTENANCE OF VILLAGE RECORDS.

3. The condition of the village records is on the whole fairly satisfactory. The form of register of agricultural stock has been simplified, and arrangements have been made for the annual numbering of cattle on a uniform system throughout the Presidency and at a time when all the stock are likely to be in the villages. The new forms of village accounts have been introduced into all the districts except South Canara and Malabar, where the system of land tenure is peculiar and separate forms of accounts are in use.

4. The agency employed for the supervision of the village records is still in an unsatisfactory state. Proposals for improving it have long since been submitted for the consideration of the Government of India, but another year has passed and no effect has yet been given to the reiterated suggestions of this Government.

5. The number of Revenue Inspectors who passed during 1887-88 the survey test prescribed for them in 1885 was 87. The total number of these officers who have passed this test up to 1887-88 is 204 as detailed below:—

District.	No.	District.	No.
Ganjam	7	Madura	4
Vizagapatam	4	Coimbatore	33
Godávari	11	Nílgiris	1
Kistna	11	South Canara	10
Bellary	19	North Arcot	18
Kurnool	14	Chingleput	22
Nellore	10	South Arcot	16
Salem	8		
Malabar	12	Total ...	204
Tinnevelly	4		

6. Definite proposals were submitted regarding the training and examination of candidates for the post of village munsifs and karnams (accountants). A manual for the use of village officers (and Revenue Inspectors) was prepared by Mr. Farmer, C.S., under the orders of Government and has been circulated to Collectors for opinion.

II.—THE ANALYSIS OF DISTRICTS WITH REFERENCE TO THEIR SECURITY FROM FAMINE.

7. The examination of the Kurnool district and the checking of a special return of agricultural stock were completed in May 1887. The district has been divided into nineteen agricultural tracts, and the existing statistics tabulated by the agricultural inspectors, with such assistance as the existing district establishments could afford; the results have been worked up and the analytical account of the district prepared by Mr. Benson. This is now in the press and will shortly be issued. Arrangements are in progress for taking up the analysis of the Cuddapah district, and field work there is now being commenced. Acting on a suggestion of the Government of India, it has been resolved that in future analyses, the tractwar plan shall be abandoned, and the analysis proceed village by village. To facilitate this, a series of forms following the lines of the "Purgana Book" of the North-Western Provinces has been devised for the registry of village statistics—Board's Proceedings, No. 120, dated 8th March 1888. The duty of supervising the preparation of these statistics and of drawing up the analyses of districts based on them and on his own observations has been entrusted to the Assistant Director, Mr. C. Benson. It is hoped that when the taluk establishments are strengthened, it may be possible for them to perform the greater part of the work now done by the special staff of agricultural inspectors.

8. A most valuable and interesting report on the Anantapur district was received during the year from the Collector, Mr. Nicholson, which will be of the greatest assistance in carrying out the analysis of that district, which has only been deferred pending the completion of the survey and settlement operations now in progress there.

III.—SYSTEM OF COLLECTION OF REVENUE AND RENTAL IN PRECARIOUS TRACTS.

9. There is nothing special to record under this head.

In this Presidency, the Government revenue is collected in instalments fixed with reference to the requirements of the several districts. In 1886 it was decided that, except in Tanjore where eight instalments, from November to June, are paid, there should, for all other districts, be only four in-stalments, from December to May. The revised kistbandi (scale of instalments) has been introduced in some districts and in the rest it has been deferred pending the orders of Government as to the date from which and the order in which it should be introduced into them.

IV.—MEASURES OF PROTECTION.

10. *Communications.*—The Guntakal-Nandyál section of the Bellary-Kistna State Railway—90 miles—was opened for traffic on the 11th July 1887. The line from Tirupati to Nellore—83 miles—was opened for traffic on the 15th September 1887. On the Madras Railway, South-west line, the Pálghat branch ($2\frac{1}{2}$ miles) and the Calicut extension (9 miles) were opened for public traffic on the 2nd January 1888. The extension of the Nizam's Guaranteed Railway from Warangal to the Singareni coal fields was opened for public traffic on the 1st January 1888, and it is hoped that the extension from Donakal, the junction for the coal fields, to Bezváda will be opened before the close of the current year. There are other lines, some under survey, others under construction, which, when completed, will serve largely to protect the country from the effects of famine.

11. *Irrigation.*—The Barur tank supply channel and its head-sluice were for the first time brought into use during the year under review.

12. *Minor Irrigation Works.*—The year's allotment for, and the outlay on minor irrigation works were Rs. 3,00,000 and 2,92,181, respectively, against Rs. 2,75,000 and 2,60,000 in the previous year. The expenditure in the year was therefore about 95 per cent. of the allotment.

13. *Agricultural advances.*—The amount of loans granted under the Land Improvement Act was Rs. 79,008 and that under the Agriculturists Loans Act,

Rs. 38,649. The total amount of advances made was thus Rs. 1,17,657 against Rs. 24,967 in the previous year. The advances amounted to over Rs. 5,000 in each of the districts of Anantapur, Tinnevelly, Coimbatore and Salem.

14. *Native arts and manufactures.*—Mr. Havell, Superintendent, School of Arts, visited the districts of Coimbatore and Malabar on a tour of inspection, in the beginning of the current calendar year. His report was submitted to Government with the Proceedings of the Board of Revenue, dated 11th May 1888, No. 211. The industries that came under his notice were purely local. None seem to be particularly flourishing, while those that have come into contact with foreign competition—for example, cotton-weaving and iron-smelting—seem to be on the decline or actually dying out.

15. *Fodder and fuel reserves.*—These are not administered in this department, but it may be noted that during the year 714 square miles were constituted reserved forests and 1,724 square miles reserved lands, thus raising the extent under the two heads to 3,026 and 9,217 square miles, respectively, at the end of the year 1887-88.

16. *Ensilage.*—In 1886, the Government directed that certain experiments should be carried out by selected officers, and a report on the results has recently been submitted to Government. Experiments were made in the marginally-noted districts, and altogether 78 silos have been opened, of which 32 were partially or wholly successful. In some cases want of care or want of knowledge vitiated the results, but deducting these, 58·5 per cent. of the silos were more or less successful. The experiments were conducted under unfavorable conditions. Many of the officers to whom they were entrusted had no special knowledge of the subject, and some were removed, from the stations were the experiments where made, before completing them.

Vizagapatam.	North Arcot.
Godávari.	Salem.
Kistna.	Chingleput.
Nellore.	South Arcot.
Cuddapah.	Trichinopoly.
Anantapur.	Tinnevelly.
Bellary.	Nílgiris.

17. The experiments made confirm the knowledge that silage can be easily made with but little care; that most cattle will eat it readily enough, and some even greedily, but as yet they have given no data on which to base definite conclusions regarding the cost of carrying out the process; nor has it been possible to do anything towards a proper comparison of the feeding value of silage with that of ordinary hay, or with green fodder raised artificially by the aid of irrigation. Attention will be directed most closely to the first of these points, and the others will be noticed as opportunity offers. The experience * of Mr. J. W. Hockin, of Vayitri in the Wynaad, was to the effect that charging only for the collection and storage of the grass, which itself cost nothing, he could turn out silage at a cost of 20 cubic feet a rupee; this quantity he reckons to be sufficient feed for 25 head of cattle a day.

* Report in Board's Proceedings, No. 34 dated 25th July 1888.

18. *Fodder plants.*—No further reports have been received regarding the *edible cactus* referred to in paragraph 15 of the report for last year, but it appears probable that the plant was introduced long ago; it is to be found in many villages throughout the Chingleput district. Further inquiries are being made on the subject.

19. An investigation has been commenced with the aid of the Chemical Examiner into the feeding value of the different fodders used in the country. So far the investigation is incomplete, but it is expected that it will be concluded at an early date.

20. *Arboriculture.*—This subject does not ordinarily come under the survey of the department, experiments in arboriculture being conducted by the Forest department under the direction of the Land Revenue Commissioners; but on the suggestion of Mr. Weld, of the Civil Service, further inquiries are being made for the seed of *eucalyptus* which may be expected to flourish in tropical India, and the Secretary of State has been asked to obtain a supply of the seed of the Peruvian Custard apple (*anana cherinalia*) which is believed to be superior to the variety commonly grown in this Presidency.

21. During the year a monograph on the cocoanut palm, prepared by retired Deputy Surgeon-General J. Shortt for the department, was published.

V. Agricultural Experiments.

22. *Farms.*—No Government farm now exists in the Presidency, except the stock-farm alluded to further on. *The Madura farm* is the only institution of the sort towards which Government contributes any support. The farm was visited by the Assistant Director in August during his tour with Mr. Caine, and arrangements were then made to carry out an experiment in shade-drying tobacco. On the occasion of this visit the farm was found in an unsatisfactory state, but the whole question of the continuance of Government support to it was at the time under discussion and the Director's proposals on the subject have since been laid before Government. As far as the conditions under which it is placed have allowed, the farm has hitherto fairly fulfilled expectations, but the Farmer's club, under the auspices of which it was started, has ceased to exist, and unless some other controlling authority can be put in charge, the institution will and must still further languish, if it does not die of inanition. It has been recommended that the Government grant should be continued, if the farm and the property thereon be transferred to the District Board and managed by them, subject to inspection by this department.

23. *Experiments with crops.*—No further experiments were made during the year regarding the growth of *wheat* in any part of the Presidency, but several inquiries regarding the crop have been received by the department from districts where the crop is not at present grown. The *barley* distributed on the Nílgiris during the early part of 1886 continues to give great satisfaction, and recently a further supply of English seed has been obtained for distribution. The Nílgiri Brewery Company are reported to have purchased last year nearly 5,000 bushels of seed grown from the English barley imported in 1886 at an average price of Rs. 1-12-0 per bushel, and the sample is reported to be superior to local grain for malting purposes. Several common causes of depreciation of the samples have been pointed out and detailed instructions have been drawn up, by attention to which the native growers may learn how to produce a better and more valuable crop. A small competition was held at Kethi in October at which several small prizes were awarded for the best samples of barley produced, and it is intended to inaugurate in the current year a regular system of field contests in order to encourage the improvement of the growth and management of this crop.

24. The Collector of the Nílgiris pointed out that there was a large demand for horse forage of superior quality about Coonoor, Wellington and Ootacamund, and suggested that a supply of seed oats should be obtained for supply to the native growers of the Nílgiri plateau. The Secretary of State was thereupon requested to furnish the department with 50 bushels during the year. They arrived in April last, but, owing to an unfortunate mistake in the office of the Agent for Government consignments, they were not forwarded to the Collector or to the Board until the end of July, and thus a season has been lost.

25. During August and September last, Mr. Caine, professional tobacco-curer, was deputed from the Andamans on a short visit to the Presidency, and after visiting the Kurnool, Trichinopoly, Madura and Coimbatore districts in company with the Assistant Director, submitted a report on his observations. The conclusion which his limited observation of the actual cultivation of the plant enabled him to formulate was that the conditions of growth must be considerably modified if a cigar tobacco of good quality is aimed at, and that the system of drying and curing the leaf generally in vogue is fatal to the production of good tobacco. Mr. Caine is expected to return to the Presidency for 18 months in September next, and proposals for his employment have been submitted to Government (Board's Proceedings, No. 278, dated 18th June 1888).

Before leaving, Mr. Caine wrote out a few brief instructions for carrying out some experiments in shade-drying tobacco that were to be undertaken in the Kurnool district and on the Madura farm. No report has been received regarding either, and the results cannot be determined until Mr. Caine has inspected the leaf dried under his directions.

26. The *Baltic linseed* received from the Secretary of State was distributed to the Collectors of Bellary, Kurnool, Cuddapah and Vizagapatam for experiment, but the

seeds were received very late in the season and reached Kurnool, which is at present the chief linseed-growing district in the Presidency, too late for sowing on dry land. The Collector, however, arranged to sow them as a second crop in wet land. In the Bellary and Cuddapah districts, in every case where the seed was sown, the result was a failure. In Vizagapatam the seed was sown and the plants grew and flowered, but did not produce any pods with seed.

27. During the year a small quantity of *Puerh tea seed* was received from the Government of India and forwarded to the Nílgiris for distribution to planters for experiment, but it is reported that the seeds did not germinate.

28. The experiments made at Mangalore during the year with the *evaporating apparatus* obtained from America for extracting sugar from *sorghum* resulted in failure, and it is not intended to carry on further experiments as no adequate arrangements for conducting them are possible at present, and it appears doubtful from American reports whether there is much possibility of a sorghum sugar industry attaining success unless it be carried on in large factories.

29. *Hungarian millet seed.*—Only some of the officers to whom this seed was distributed have reported on the experiment. In Anantapur, Bellary and Kurnool the season was not favorable, and the seeds are reported to have been kept for trial during the current year. In Salem, some seeds failed and some germinated, but unfortunately the seedlings were eaten by cattle. In the Botanical Gardens, the seeds did not germinate at all and the Principal of the College of Agriculture, Saidápet, reports that the seeds were tested and found to have lost their vitality.

30. *Insects.*—Several specimens of insects were forwarded during the year to the Superintendent of the India Museum, Calcutta, for identification, but it is evident that, without trained observers to collect the specimens, much good cannot ordinarily be done in this way. One specimen having been sent up from Ganjam under a single name was found to contain the pupœ of no less than three species of moth. In consequence of this no really valuable information has been collected.

31. *Indigo.*—An inquiry was made during the year, at the instance of the Madras Chamber of Commerce, on the subject of the adulteration of indigo, with no further result than to show that the practice is a long standing one, but that it was not known whether or to what extent aniline dyes were used for the purpose. The admixture of mud with the cake appears to be common.

32. Another inquiry conducted at the instance of the Government of India showed that town refuse and night-soil are not nearly so largely used in this Presidency as they might be, and that, judging from the results obtained in some places, *e.g.*, Kurnool, where Rs. 82 per 1,000 of population is realised from the sale-proceeds of the refuse, a valuable set-off against the cost of conservancy might be gained by Municipalities from this source, and that, by degrees, the prejudices against the use of nightsoil may disappear and its value as a manure be fully appreciated.

33. *Exhibitions.*—Three mofussil exhibitions were held during the year under report, but that at Erode was alluded to last year having been held on the 19th to 21st April. The other two shows were held at Bellary and Salem on the 16th and 17th February and 23rd and 24th March, respectively, and were on the whole successful.

34. *Glasgow International Exhibition.*—75,000 cigars were collected in the Agricultural Department from the districts of Godávari, Trichinopoly and Madura and sent to the exhibition, and all Collectors were instructed to afford assistance to the local Committee in collecting exhibits.

35. *The introduction of improved implements and machines.*—One of the most satisfactory features of the mofussil shows was the evidence they produced that considerable attention is being paid in many quarters to the question of devising cheap and efficient water-lifts, a question of the greatest importance in this country; another feature which evidences progress is the extent to which improved sugar mills are coming into use in different parts of the Presidency. Improved ploughs also appear to be taking more hold on the country and to be more utilised in actual work year by year. This may seem to be but a poor return for years of labor and the expenditure of much money by Government in the endeavour to improve the agriculture of the country, but in a

land so backward and poor and conservative as India, the work of the leaven of progress is sure to be slow at first, but that it *is* working these signs seem to prove.

36. The plan of organizing and sending out into the districts a travelling show of agricultural implements first attempted on a definite system in 1886 was followed up in the year under report, and a show visited parts of the Coimbatore, Salem and North Arcot districts and would have proceeded further, if it had not been stopped short owing to the prevalence of cholera in the latter district. The show commenced at Coimbatore at the end of June and ended at Sholingur on the 7th September. It was in direct charge of the Assistant Director for part of the time and was, when he left it, carried on by an Agricultural Inspector. The results of the show were generally satisfactory and the ryots generally admitted, as others at other times and other places have admitted, the efficiency and completeness of the work done by the ploughs exhibited before them, but took, as so many before them have done, three objections to them as practicable implements for the Indian ryot. These were (1) their high cost (2) the difficulty of repairing them locally, and (3) their heavy draught. The last is not a solid objection, for in the case of the smaller ploughs, the draught is not more than the ordinary cattle of the country can easily manage. To remove the other objections the Government cannot do much; the first is the business of the manufacturer, the second of the ryot himself. All that Government can do it has done in procuring facilities in first-class workshops in Madras for the the free instruction of village blacksmiths in the art of repairing their ploughs and in permitting district officers to act as intermediaries between the ryot and the manufacturer in procuring ploughs and other implements or parts of them.

37. An inquiry was instituted during the year regarding the extent to which the ploughs sold in the southern districts during the continuance of the travelling show of 1886 were used. The result of the inquiry was as follows:—

District.	Ploughs.		Area ploughed with improved ploughs.	
	Bought.	Used.	Total.	Per plough.
South Arcot	104	84	537·5	6·3
Tanjore	56	42	151	3·6
Trichinopoly	25	16	69	4·3
Tinnevelly	65	63	442	7·1
Total ..	250	205	1,189·5	5·8

Information regarding a few of the ploughs entered as not used could not be obtained and a few are not accounted for. On the whole the results are encouraging and a continuance of the system during the current year has been resolved on.

38. Besides assisting and taking part in the travelling show, one firm, Messrs. Massey and Co., placed a number of ploughs at the disposal of the Collector of the Kistna for demonstration purposes, but nothing further has been heard of the matter as yet. The same firm also, it is believed, have on their own account, in continuation of the plough trials held during the Bellary exhibition, been conducting some demonstrations with their cotton-soil ploughs in the Bellary and Anantapur districts, and, it is understood, with good results as to the sale of their implements.

39. A further attempt was made during the year to show the value of the bamboo-seed drill to the ryots of Trichinopoly, but though the implement was worked at nine places, owing to the want of rain at the time, the drill could not be worked in a really satisfactory manner, and the ryots repeated their objections to its use as noted at paragraph 27 of the last report. The difficulties experienced in the attempts made to bring home the advantages of the system of drill sowing to the ryots of the southern districts, although it is generally practised in the northern, will illustrate the nature of the difficulties that attend the attempt to introduce improvements in the agricultural practice of the country.

40. It appears from the replies to inquiries made regarding the advisability of exhibiting the Beheea sugar-mill in different districts, that it is already largely used in the Bellary and Godávari districts, and also that it is being purchased freely in the Trichinopoly district. Besides this, the local agents for "Shank's patent sugar-mills"

report that their mills are being taken freely by ryots from different parts of the country, and they have offered to send out mills for exhibition in charge of a competent man to any district where the Collector can arrange to have them shown. It appears, therefore, that this department need now do but little to show the value of these machines to the ryots, but in view of the desirability of inducing the manufacturers to turn out lower-priced machines, it is proposed to hold a competition at which they shall be asked to exhibit for trial mills costing not more than Rs. 100. Messrs. Thomson and Mylne's improved sugar-boiling pans have not met with favor generally in this Presidency, and an offer of theirs to instruct sugar-cane growers in the making of grain sugar could not be accepted owing to the fact that the growers in the Presidency were not willing to defray the cost of the experiment.

41. *Sericulture.*—The proposals made during the year for detailing a special officer to make systematic arrangements for collecting cocoons and rearing silkworms of the tassar silk moth were accepted by Government, and are now being carried into effect. It is hoped that this may be the first step towards the creation of an important industry which will give employment to a large number of people. It is proposed at first to confine operations to the Chingleput district, but if the industry becomes established there, it may be extended to others. The suffocating machines have been obtained from Calcutta, and there is now no bar to the prosecution of the experiment.

VI.—Cattle Breeding and Veterinary Inspection.

42. *Cattle and Sheep Breeding.*—The acquisition of a block of land near Hosúr in the Salem district was sanctioned during the early part of the year, and arrangements were at once made for the erection of the necessary shedding for the accommodation of the stock, which were transferred from Saidápet during December last. Purchases on a small scale were made during the remaining months of the year, but the officer entrusted with the duty did not succeed in obtaining many bulls during the time he was specially deputed for the purpose. It is intended to purchase young bulls and, after keeping them at the depôt for a few years, send them out into selected localities in the Coimbatore and Salem districts to serve as sires. At the same time, endeavours will be made to induce the ryots in these localities to castrate their own inferior bulls at such an early age as will render it impossible for them to do any harm amongst the herds.

43. The depôt at Hosúr is in charge of an overseer under the orders of the Assistant Director and occasionally Mr. Shunker, the Deputy Inspector of Cattle Diseases, is able to inspect it, but the arrangements are admittedly tentative and may possibly need revision at an early date. It is not, however, possible to expect any results from the experiment unless it be continued for several years and unless the utilisation of the bulls after they have been sent out is carefully supervised by the district officers.

44. The cattle moved to the depôt from Saidápet were chiefly of the Aden breed, and several bulls of that breed have already been stationed in different districts. The bulls purchased were all of the Alambadi breed which is bred on the banks of the Cauveri in the Salem and Coimbatore districts. The Government, early in the year, ordered the transfer of the Amrit Mahal cattle stationed on the Palnis and at Devikolam to the depôt. This was carried out, but the stock on arrival at Hosúr was found to be so poor that its disposal has been recommended. The small sheep-flock which had been maintained at Saidápet and bred there with great care for many years was transferred to the depôt with the cattle and it is intended to increase the flock largely and endeavour to obtain some superior rams to breed from, with the object of improving the wool-producing quality of the flock. A number of rams from the existing flock are now being sent to the Coimbatore district and more are available.

45. The number of bulls belonging to the department stationed in the districts was increased from two at the beginning of the year to seven at its close. Of these, one is stationed at Madura, one in South Canara, three in Coimbatore and two in Salem. At Madura there is also another bull presented by Government to the Farmers' Club, which is partially utilised. Several other bulls have been at various times placed in the hands of private individuals for breeding purposes. All are of the Aden breed. Accurate statistics as to the number of cows covered by these bulls are not available in all cases, but, so far as can be ascertained, the bulls sent out hitherto by the

department have on the whole been fairly utilised and have done fairly good service. It has been found, however, that many of the Adens are sluggish in serving.

46. *Pony Breeding.*—These operations were in charge of the Collector of Coimbatore and Mr. Dumergue, the Sub-Collector of Salem, during the year under report, the former officer being assisted by Mr. Shunker during the covering season. To Mr. Shunker is also entrusted the general charge of all the Government stallions and the training of salustries in the operation of castration. Special reports on these operations, which were confined to the districts above noted, were submitted during the year. At the beginning of the year the number of stallions was eight. Two more (13·2 high) were purchased in September; the number of mares covered during the season was 305. As far as the results of the coverings in previous years are known, the percentage of successful coverings was 28. In Coimbatore the number of mares brought to the stallions was small; the number was much greater in Salem.

47. In connection with pony breeding, the castrating operations commenced in the previous year were continued with great success in Salem where 288 tats or village ponies were castrated with only three casualties, but with less vigour in Coimbatore where the number castrated was only 67 during the year. It has been found possible to almost entirely dispense with the reward alluded to in paragraph 46 of the last report in Salem, but the grant of it is continued in Coimbatore.

48. Two salustries and two pupils are engaged in this work in Salem, and in Coimbatore one salustri and two pupils are at work under the orders of Mr. Shunker. Great difficulties were found in obtaining suitable men for these posts and the only one trained in Coimbatore during the year left the service soon after the end of it. Attention having been drawn to the defective training of the Stock Inspectors in castration, arrangements were made for the proper training of a few of them during the year, but it was not found possible to put many of them through a course of practice in this, owing to the general prevalence of cattle disease in many districts of the Presidency. During the year the question of the proper covering season to be adopted was the subject of considerable discussion; but the Government finally dicided that the point should be decided by the local officers; all that Government insisted upon was that the stallions should have an "off" season. This has been fixed at October to June both inclusive.

49. The Government decided, during the year, to extend the operations to the Nílgiris the arrangements have been made for giving effect to this decision. The number of stallions will have to be increased and that of the salustries in charge also.

50. *Cattle Disease Prevention.*—This branch of the work of the department was for the greater part of the year in charge of the Assistant Director in addition to his ordinary duties. Mr. Mills, who had been in charge of the work since August 1882, proceeded on short leave in January 1887, but resigned his appointment in August. His place was not filled up until the end of February 1888, when Mr. Veterinary Surgeon Hazelton of the Army Veterinary Department was appointed to it. The Deputy Inspector of Cattle Diseases, Mr. Shunker, was on duty during the whole year, but was almost exclusively employed in connection with pony and stock breeding operations. At the beginning of the year there were seventeen Stock Inspectors on duty in the districts and two probationers under training. One probationer was appointed Stock Inspector of Bellary and the other dismissed. Two Stock Inspectors resigned during the year. Mr. Hazelton's report on the operations of his branch of the department is appended to these Proceedings.

51. Considerable attention was given during the year to the system of reporting and recording cattle disease in the villages, and the forms and reports have been greatly simplified and systematised, and it is hoped that in future some degree of accuracy may be attained. That it will be successful is certain if the local officers will only pay attention to the working of the system, and the cattle disease prevention officers closely inspect its working. The village authorities have now to furnish or maintain (1) a report on the outbreak of disease (2) a weekly progress report of disease (3) a register of cattle deaths (4) a monthly return of cattle deaths, being an abstract of No. 3. The return No. 4 is tabulated in the Collector's offices by taluks and in the Board's office by districts and the figures forwarded to the Inspector of Cattle Diseases for his remarks.

52. During the year the ravages of cattle disease exceeded, as far as the recorded statistics show, any previous experience. Detailed statements are given in the appendix showing the number of deaths reported during each month of the year and for each district, of which the following is an abstract:—

Description of live stock.	Disease.						Deaths from other causes.
	Rinderpest.	Anthrax.	Foot and mouth.	Diarrhœa and dysentery.	Variola.	All other diseases.	
Cattle	116,558	34,432	2,763	3,966	733	15,771	88,851
Sheep and goats ..	5,180	1,816	211	959	3,373	5,430	29,644
Horses and ponies ..	3	..	3	2	..	31	101
Total ..	121,741	36,248	2,977	4,927	4,106	21,232	118,596
Report in previous year.	33,789	18,558	6,546	..	9,839	21,843	53,585

53. It is believed that rinderpest affects only the ruminantia and that epizootic aphtha does not affect the horse, so that the deaths of horses attributed to these diseases are probably inaccurately returned. The other returns also are not entirely free from suspicion, but show generally the state of the country as regards disease. On the whole, the loss to the agricultural community from disease amounted to 174,235 head of cattle, 16,958 sheep and goats and 39 horses and ponies, representing a value at very low rates of estimation of nearly twenty-six lakhs of rupees.

54. The principal scourges were rinderpest and anthrax, although amongst the sheep and goats variola caused a considerable mortality. Rinderpest was prevalent throughout the year, the mortality increasing from 4,781 cattle in April to 17,071 in December and only falling to 12,274 in March. It was prevalent in all districts, but especially virulent in South Arcot and Chingleput, in Kurnool and the Ceded Districts and in the Kistna, the deaths in the first two districts nearly reaching 50,000, and in the second group nearly the same figure. For the Kistna over 8,000 deaths were reported from this disease alone, and it has since spread into the Godávari. Anthrax also prevailed throughout the year, the number of deaths reported increasing from 809 in April to 5,110 in November and falling to 1,312 in March. The disease was particularly fatal in the Chingleput, North Arcot, Kurnool and Kistna districts, and Mr. Hazelton is of opinion that the figures do not approach the actual mortality, but does not explain why he thinks so. Amongst the deaths due to causes other than disease are included 44 cases of poisoning, 15 of which were reported from Tinnevelly and 10 from Malabar, 1,904 cases of snake-bite and 11,229 cases of deaths by wild animals.

55. The inaccuracy of the usual return of cattle and sheep kept renders any general comparison of the number of deaths with the number shown therein useless, but in the Kurnool district, where a special and tolerably accurate census of the live stock of the ryots has been taken, the deaths reported to have occurred from disease amount to 3·6 per cent. and those from all other causes to nearly 5 per cent. of the total number kept. It is probable that the census returns from that district are more accurate than those received generally from the districts in the Presidency. This would show that, whilst the total loss amounts to a sufficiently startling figure, the loss caused by disease—and disease was very fatal in Kurnool during the year—was not great on the whole.

(A true Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Secretary to Government, Revenue Department.
„ all Collectors.
„ the Inspector of Cattle Diseases.

APPENDIX I.

STATISTICS of mortality among cattle, sheep and goats, and horses and ponies in the Presidency of Madras for the year 1887-88.

Months.	Description of animals—cattle, sheep and goats, and horses and ponies.	NUMBER OF DEATHS DUE TO												Total number of deaths from all causes.
		Rinderpest.	Anthrax.	Epizootic aptha.	Diarrhœa and dysentery.	Variola (sheep pox, &c.)	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild animals.	Total.	
April	Cattle	4,781	809	190	143	193	1,382	7,498	..	4,136	143	5	492	4,776	12,274
May	Do.	4,051	1,118	204	155	45	1,021	6,594	..	4,399	95	5	507	5,006	11,600
June	Do.	3,791	1,519	216	197	26	1,191	6,940	..	7,652	154	4	643	8,453	15,393
July	Do.	5,422	3,039	207	116	85	1,606	10,475	5,628	916	144	1	689	7,378	17,853
August	Do.	6,979	3,668	131	118	57	1,454	12,407	5,010	712	183	2	734	6,641	19,048
September	Do.	7,762	4,187	149	119	12	1,318	13,547	4,163	748	191	3	705	5,818	19,357
October	Do.	9,440	4,098	234	287	47	1,692	15,498	..	6,797	238	..	727	7,762	23,260
November	Do.	13,783	5,110	205	314	33	1,433	20,878	..	6,553	170	17	671	7,411	28,289
December	Do.	17,071	4,425	378	566	46	1,456	23,942	..	12,459	175	1	807	13,442	37,384
January	Do.	15,827	3,371	335	361	26	935	20,855	6,655	675	142	..	596	8,068	28,923
February	Do.	15,677	1,776	228	473	36	1,112	19,302	6,132	371	88	2	508	7,101	26,403
March	Do.	12,274	1,312	286	1,117	127	1,171	16,287	5,947	439	101	4	512	7,003	23,290
	Total	116,558	34,432	2,763	3,966	733	15,771	1,74,223	33,535	45,857	1,824	44	7,591	88,851	2,63,074
April	Sheep and goats.	956	65	53	16	980	244	2,314	..	974	15	..	247	1,236	3,550
May	Do.	533	3	24	4	511	295	1,370	..	839	8	..	231	1,078	2,448
June	Do.	430	168	15	1	459	178	1,251	..	1,227	5	..	365	1,597	2,848
July	Do.	287	130	5	51	208	277	958	544	68	5	..	274	891	1,849
August	Do.	374	219	6	3	105	320	1,027	594	85	6	..	396	1,081	2,108
September	Do.	57	46	..	4	74	167	348	504	75	2	..	290	871	1,219
October	Do.	925	56	3	1	97	303	1,385	..	3,098	2	..	345	3,445	4,830
November	Do.	186	22	..	12	118	263	621	..	2,517	16	..	373	2,906	3,527
December	Do.	304	131	10	13	79	570	1,107	..	10,406	3	..	362	10,771	11,878
January	Do.	388	48	18	407	118	1,553	2,532	2,114	527	6	..	395	3,042	5,574
February	Do.	125	806	40	251	375	548	2,145	1,163	253	4	..	142	1,562	3,707
March	Do.	615	122	37	196	229	712	1,911	932	37	6	..	189	1,164	3,075
	Total	5,180	1,816	211	959	3,373	5,430	16,969	5,851	20,106	78	..	3,609	29,644	46,613
April	Horses and ponies.	..	..	..	..	..	5	5	..	10	..	..	1	11	16
May	Do.	..	..	3	..	..	..	3	..	10	..	..	1	11	14
June	Do.	..	..	..	..	..	5	5	..	14	1	..	3	18	23
July	Do.	..	..	..	..	..	5	5	4	3	..	..	3	10	15
August	Do.	..	..	..	..	..	6	6	2	3	1	..	3	9	15
September	Do.	1	..	..	..	..	3	4	3	6	..	..	4	13	17
October	Do.	..	..	..	1	..	..	1	..	5	..	..	1	6	7
November	Do.	1	..	..	..	..	3	4	..	3	..	..	1	4	8
December	Do.	..	..	..	..	..	2	2	..	4	..	..	2	6	8
January	Do.	..	..	..	..	..	1	1	..	..	..	..	6	6	7
February	Do.	..	..	..	..	..	1	1	1	..	..	..	1	2	3
March	Do.	1	..	..	1	..	..	2	1	1	..	..	3	5	7
	Total	3	..	3	2	..	31	39	11	59	2	..	29	101	140

APPENDIX II.

STATISTICS of mortality among cattle, sheep and goats, and horses and ponies in the districts of the Presidency of Madras for the year 1887-88.

Districts.	Description of animals—cattle, sheep and goats, and horses and ponies.	NUMBER OF DEATHS DUE TO												Total number of deaths from all causes.
		Rinderpest.	Anthrax.	Epizootic aptha.	Diarrhœa and Dysentery.	Veriola (sheep-pox, &c.)	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild animals.	Total.	
Ganjam	Cattle	763	585	16	92	217	564	2,237	491	452	52	..	82	1,077	3,314
Vizagapatam ..	Do.	422	151	28	..	..	279	880	418	557	21	..	33	1,029	1,909
Godávari	Do.	2,430	1,491	153	110	..	225	4,409	1,599	1,351	64	1	89	3,104	7,513
Kistna	Do.	8,268	5,964	166	1,569	3	215	16,185	944	264	76	..	59	1,343	17,528
Nellore	Do.	1,483	651	487	16	..	1,261	3,898	352	118	3	..	..	473	4,371
Cuddapah	Do.	7,032	1,016	58	45	..	338	8,489	550	758	26	4	163	1,501	9,990
Anantapur	Do.	16,620	19	130	31	1	1,300	18,101	1,483	1,314	10	..	51	2,858	20,959
Bellary	Do.	7,993	40	58	28	..	651	8,770	1,190	636	15	1	61	1,903	10,673
Kurnool	Do.	14,686	2,948	290	159	279	5,633	23,995	2,583	4,885	189	7	344	8,008	32,003
Madras	Do.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chingleput	Do.	12,466	6,291	21	91	..	875	19,744	2,456	2,628	318	..	32	5,434	25,178
North Arcot	Do.	3,035	9,624	43	839	3	588	14,132	3,710	7,249	319	..	428	11,706	25,838
South Arcot	Do.	34,704	1,682	106	..	..	1,121	37,613	2,678	4,819	168	..	56	7,721	45,334
Tanjore	Do.	320	1,331	19	14	..	144	1,828	..	607	68	2	1	678	2,506
Trichinopoly	Do.	59	..	108	1	32	293	493	913	2,248	59	..	13	3,233	3,726
Madura	Do.	15	52	181	33	52	189	522	424	1,160	39	1	109	1,733	2,255
Tinnevelly	Do.	672	651	372	201	65	382	2,343	1,887	3,999	80	15	48	6,029	8,372
Coimbatore	Do.	186	273	27	176	37	669	1,368	901	1,715	56	3	493	3,168	4,536
Nilgiris	Do.	65	..	85	..	..	8	158	171	48	2	..	52	273	431
Salem	Do.	470	1,245	241	88	..	18	2,062	..	..	..	..	..	..	2,062
South Canara ..	Do.	4,741	418	106	29	4	552	5,850	3,629	3,400	36	..	2,536	9,601	15,451
Malabar	Do.	128	..	68	444	40	466	1,146	7,156	7,649	223	10	2,941	17,979	19,125
	Total ..	116,558	34,432	2,763	3,966	733	15,771	1,74,223	33,535	45,857	1,824	44	7,591	88,851	2,63,074
Ganjam	Sheep and goats.	3	5	..	4	2	4	18	8	16	3	..	19	46	64
Vizagapatam ..	Do. ..	..	..	7	..	..	9	16	26	59	..	..	51	136	152
Godávari	Do. ..	..	..	..	..	13	..	13	8	10	..	..	98	116	129
Kistna	Do. ..	346	77	..	..	..	..	423	12	47	..	..	60	119	542
Nellore	Do. ..	110	45	64	..	..	126	345	86	28	1	..	..	115	460
Cuddapah	Do. ..	324	64	19	4	546	607	1,564	26	283	..	..	563	872	2,436
Anantapur	Do. ..	399	..	8	121	309	1,139	1,976	184	117	..	..	211	512	2,488
Bellary	Do. ..	84	14	49	..	..	52	199	50	16	..	..	24	90	289
Kurnool	Do. ..	1,433	351	17	24	1,833	256	3,914	202	620	18	..	814	1,654	5,568
Madras	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chingleput	Do. ..	133	64	7	13	8	73	298	159	144	5	..	31	339	637
North Arcot	Do. ..	1,262	122	..	..	..	102	1,486	145	605	9	..	271	1,030	2,516
South Arcot	Do. ..	895	32	21	..	..	788	1,736	194	1,986	2	..	70	2,252	3,988
Tanjore	Do. ..	..	12	..	..	..	26	38	..	212	2	..	2	216	254
Trichinopoly	Do. ..	..	..	..	..	..	25	25	507	3,196	5	..	36	3,744	3,769
Madura	Do. ..	23	53	..	133	..	132	341	126	1,279	5	..	56	1,466	1,807
Tinnevelly	Do. ..	156	922	17	593	662	1,956	4,306	3,828	9,834	18	..	693	14,373	18,679
Coimbatore	Do. ..	1	28	..	62	..	128	219	155	1,512	6	..	446	2,119	2,338

Statistics of mortality among cattle, sheep and goats, and horse and ponies in the districts of the Presidency of Madras for the year 1887-88 —*cont.*

Districts.	Description of animals—cattle, sheep and goats, and horses and ponies.	Number of deaths due to												Total number of deaths from all causes.
		Rinderpest.	Anthrax.	Epizootic aptha.	Diarrhœa and Dysentery.	Variola (sheep-pox, &c.)	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild animals.	Total.	
Nilgiris	Sheep and goats.	..	..	..	..	..	..	..	3	..	..	..	6	9	9
Salem	Do. ..	11	27	2	4	..	..	44	..	..	..	..	..	..	44
South Canara ..	Do. ..	..	..	..	..	..	..	..	1	4	..	..	10	15	15
Malabar	Do. ..	..	..	..	1	..	7	8	131	138	4	..	148	421	429
	Total ..	5,180	1,816	211	959	3,373	5,430	16,969	5,851	20,106	78	..	3,609	29,644	46,613
Ganjam	Horses and ponies.	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vizagapatam ..	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Godávari	Do. ..	..	..	..	..	..	..	..	..	1	..	..	..	1	1
Kistna	Do. ..	..	..	..	..	..	..	..	..	..	..	..	2	2	2
Nellore	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cuddapah	Do. ..	..	..	..	..	..	..	..	..	2	..	..	1	3	3
Anantapur	Do. ..	1	..	..	..	..	..	1	..	5	..	..	1	6	7
Bellary	Do. ..	1	..	..	..	..	3	4	2	3	..	..	7	12	16
Kurnool	Do. ..	1	..	3	2	..	22	28	3	24	2	..	13	42	70
Madras	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Chingleput ..	Do. ..	..	..	..	..	..	..	..	2	1	..	..	..	3	3
North Arcot ..	Do. ..	..	..	..	..	..	1	1	1	9	..	..	..	10	11
South Arcot ..	Do. ..	..	..	..	..	..	..	..	..	7	..	..	1	8	8
Tanjore	Do. ..	..	..	..	..	..	2	2	..	1	..	..	..	1	3
Trichinopoly ..	Do. ..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
Madura	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Tinnevelly	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Coimbatore	Do. ..	..	..	..	..	..	3	3	1	4	..	..	2	7	10
Nilgiris	Do. ..	..	..	..	..	..	..	..	..	..	..	..	2	2	2
Salem	Do. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Canara ..	Do. ..	..	..	..	..	..	..	..	1	..	..	..	..	1	1
Malabar	Do. ..	..	..	..	..	..	..	..	..	2	..	..	..	2	2
	Total ..	3	..	3	2	..	31	39	11	59	2	..	29	101	140

APPENDIX III.

Letter from E. H. HAZELTON, Esq., V.S., A.V.D., Inspector of Cattle Diseases, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Madras, 11th June 1888, No. 670:—

I have the honor to forward herewith the annual report of this department for the official year 1887-88.

ANNUAL Report of the Inspector of Cattle Diseases.

The strength of the department on the 31st March 1888 was as follows:—

Inspector	1
Deputy Inspector	1
Stock Inspectors	17

2. The Inspector proceeded to Europe on leave on 2nd May 1887, and subsequently resigned his appointment.

3. I was appointed as Inspector of Cattle Diseases on February 28th, 1888, Mr. Benson having been in charge of the department in the meantime.

4. The Deputy Inspector has been solely employed in the superintendence of pony-breeding operations in Salem and Coimbatore districts, and the stock farm at Hosúr. He also gave a course of instruction in castration to some of the Stock Inspectors and one Probationer in the months of August and September 1887.

5. Of the two probationers who were entertained during the previous year, one has been posted as Stock Inspector to Bellary district, and the other was dismissed for insubordination.

6. Stock Inspectors T. Ramanjulu Naidu and B. Venkata Dasappah resigned their appointments, and a passed agricultural student, Streenevassa Ragava Iyengar, was given an acting appointment as Stock Inspector in Tanjore district pending his passing the prescribed examination. Stock Inspectors have been working in every district in the Presidency, but only for part of the year in the districts noted below:—

Bellary.	Coimbatore.
Cuddapah.	Ganjam.
Godávari.	Nílgiris.
North Arcot.	Salem.
Tanjore.	Trichinopoly.
Vizagapatam.	

With regard to the work done by the Stock Inspectors, I am not in a position to give any information at present, but will do so in the report for the current year.

7. The veterinary hospital at Saidápet was transferred to the Educational Department in January last. A statement of cases treated is given below:—

Cases remaining on 1st April 1887	7
Cases admitted during the year	94
Total ...	101
Cured	74
Relieved	11
Died	8
Destroyed	3
Remaining at end of year	5
Total ...	101

8. Medicines in large quantities have been supplied to the various districts with instructions for use, and many of the Stock Inspectors speak favorably of their utility.

9. *Office.*—The compilation of the statistics of the mortality from cattle disease in the Presidency has been undertaken by the Board's office. The office of the Inspector of Cattle Diseases has been removed to Chepauk. The pay of the clerk has been raised from Rs. 25 to Rs. 35 a month, and a compounder has been sanctioned in G.O., No. 128, dated 7th February 1888.

10. *Financial Statement.*—The estimated budget grant for the official year 1887-88 was Rs. 33,584; expenditure Rs. 28,587-8-2. The saving was due principally to the absence of the Inspector on leave.

11. The receipts on account of treatment of cases, &c., have been Rs. 398-9-1 as against Rs. 546-9-3 in the previous year, a decrease Rs. 148-0-2.

12. *Agricultural Exhibition.*—I attended the Salem agricultural exhibition in March, and officiated as a judge in one of the sections. No outbreak of contagious disease occurred in the animals shown.

13. *Cattle Poisoning.*—In the marginally-noted districts no cases of criminal poisoning have been reported or brought to light by the Stock Inspectors. In Malabar a few suspected cases were met with, but none were proved.

South Canara.	Coimbatore.
Tinnevelly.	Kurnool.
Trichinopoly.	Anantapur.
Madura.	Bellary.
Salem.	

In South Arcot district 9 cases were brought to the Stock Inspectors notice in Chidambaram taluk, but he "regrets to remark that the village officers and cattle owners were so careless as to preserve profound silence on the subject for more than a month, when the police were communicated with." The cases were committed to the nearest magistrate, and several doses of arsenic were found in the possession of the supposed culprits, who were dismissed for want of sufficient evidence of the identity of those who administered the poison. Then, after an interval of 7 months, the Stock Inspector was sent to investigate the matter, and he submitted a report when the case was re-opened, but again dismissed on the same grounds.

The North Arcot Stock Inspector reports that no cases of cattle poisoning with arsenic or other metallic poison came to his notice, but mentions a case of wholesale poisoning in a village in Wandiwash taluk, by two pariahs, who exhumed the carcass of an animal dead from rinderpest, and steeped the flesh in the drinking water of the village cattle. They were caught in the act and convicted, being punished by a fine * of Rs. 15 each. The pariahs are supposed to have introduced the decease into the village by bringing parts of the carcasses of an animal dead from rinderpest into it.

The Stock Inspector of the Nellore district states that in the village of Alturti, Rápúr taluk, he met with a case of cattle poisoning, held a postmortem examination and sent some of the viscera to the village magistrate to forward for analysis. He also states that chucklers of that village prepare the poison and distribute it to their immediate relatives for use and that this practice has been going on in that neighbourhood for 30 years.

14. *Act II of* 1866 was brought into operation in the districts of Kurnool, Bellary, Madura and South Canara. I can give no particulars as to the working of this Act at present, but will do so in the next annual report.

15. *Cattle Fairs.*—Stock Inspectors have visited the following cattle fairs during the past year.

Mecheri fair, Salem district, held on 26th February; closed on March 1st, 1888. About 1,000 head of cattle were brought to the fair, consisting mainly of the Alambadi and Kolar draught cattle; also some Tiruchengód dairy cattle. The sanitary arrangements were good and no contagious disease was discovered.

Karamadai fair, Coimbatore district. About 3,000 head of cattle were present, mostly draught bullocks; no breeding bulls. The sanitation was carefully superintended and no contagious disease appeared.

Chittrai Fair, Madura district, held at Thallaculam. About 17,000 head of cattle present. The Act II of 1866 was brought into operation, and all diseased animals were removed to the hospital pounds. Foot and mouth disease broke out and was repressed.

Keyoor fair, Malabar district, brought together a large number of cattle, many from Coimbatore.

Subramania fair, South Canara district. About 35,000 cattle present; the sanitary arrangements were good and there was no outbreak of disease. Act II of 1866 was introduced.

Tiruvannámalai fair, South Arcot district, is held in December. Large number of cattle from surrounding districts present. There was no outbreak of disease.

Mutulapuram fair, Tinnevelly district, is held in July. The water-supply was very scanty, and the animals had to be taken long distances for water. Cattle came from Coimbatore and Madura, but the majority belonged to the district. No disease was reported.

Kalagamalai fair, Tinnevelly district, held in January. About 5,000 head of cattle arrived, including 100 dairy cows. The sanitary arrangements were satisfactory, and no outbreak of disease occurred.

16. *Cases treated by Stock Inspectors.*—The following number of animals were treated by the Stock Inspectors during the months of December 1887, January, February and March 1888.

---

* This seems a most inadequate punishment for so grave a crime.

20th June 1888. (Initialled) W. W.

No accurate records exist for the preceding months of the past year. Rinderpest and anthrax were practically the only diseases treated :—

Cases admitted	1,568
Do. cured	476
Do. incurable	3
Do. died	254
Do. destroyed	11
Do. unknown	713
Do. remaining on the 31st March 1888	111

From the above it will be noticed that only 16—19 per cent. of cases treated died, but there is a large number of cases unknown in consequence of the Inspectors having to leave the villages before the cases terminated.

17. *Remarks.*—The Stock Inspector of Nellore district notes a great mortality among pigs and dogs in a village of Ongole taluk, caused by feeding on carcasses of sheep which had died of Braxy (anthrax) and which had been the principal food of these animals. The symptoms presented were undoubtedly those of anthrax. The same Inspector also notes that wherever rinderpest prevailed among cattle there was no cholera to be met with in man, and that the former seemed to drive away the latter.

The Stock Inspector of North Arcot when on special duty in Kurnool noted the great value of common salt in the treatment and prevention of rinderpest. He states that the disease soon disappeared on the removal of the animals to saline pastures.

The following is an extract from a letter from the Stock Inspector of North Arcot on special duty in Kurnool, to the Collector of Kurnool, dated 9th July 1887.

* * * *

"I am convinced that the ryots were formerly in the habit of giving earth-salt to their cattle daily during the summer and once a week or so at other times, and that since the prohibition of the local manufacture of salt from saline earth, the value of sea-salt has risen so high as not to be within the reach of ordinary ryots to give to their cattle. In some villages where there is a saline waste as pasture the disease has subsided sooner, when other precautions against its spreading (viz., cremation of the diseased carcasses and disinfection of their skins) were strictly observed; at other places, such as Rámallakót, Maddarpur and Narlapur, where the ryots gave common salt as advised, there was a better result and a speedy check over the spread of the disease."

18. During the month of March I was occupied in acquainting myself with the constitution and routine work of the department, and I only visited the districts of Chingleput and Salem (the latter in connection with the agricultural exhibition).

As I have been such a short time at the work, I am unable to add any remarks on the prevalence of cattle disease and the repressive measures adopted from my own experience, but I will do so in the report for the current year.

ORDER—dated 18th December 1888, No. 872, Revenue.

Miscellaneous.

The majority of the subjects referred to in the foregoing report have already been dealt with in separate orders and there is little which now requires the notice of Government. It is presumed that the allusion in paragraph 4 is to the rejection of the proposals for strengthening the staff of Revenue Inspectors. The Government are not aware of any other proposals for improving the inspection of village records which have received their approval.

2. His Excellency in Council regrets that, owing to the analytical report on the Kurnool district not having yet been issued, he is unable to form a definite opinion of the work done during the year by the Assistant Director. It was stated in the administration report for 1886-87 that it only remained to tabulate the statistics and to compile the analysis, but although the Inspectors engaged upon the collection of the statistics were brought to head-quarters to assist Mr. Benson, that officer seems to have taken a whole year to complete the analysis. The present report contains no information regarding other work performed by him.

3. In reviewing the report for 1886-87, the Government drew attention to the necessity for further information regarding the work of the local Cattle-Disease

(now Stock) Inspectors and requested that the omissions which were noticed might be supplied in future reports. This, however, has not been done, and though the Government admit that Mr. Hazelton, who was only in charge of this branch for the last month of the year, could not be expected to give a complete account of the work done by his subordinates, they consider that something more than the meagre information afforded might have been furnished by the Director. So far as can be gathered only 1,568 cattle were treated by the Stock Inspectors, of which 476 were cured, 265 died, 3 were incurable, 111 remained under treatment at the end of the year, and in 713 cases the results were not known. Nothing is said as to the establishment or working of hospital pounds or of other operations under Act II of 1866. So far as this report shows, there has been no satisfactory return for an expenditure of nearly Rs. 30,000 on the cattle-disease department. The total number of cattle that died from disease was 174,223, but the number of those attacked is not given, so the Government have no adequate means of judging by comparison with former years whether the indirect efforts of Stock Inspectors have appreciably affected the destruction caused by cattle-diseases. Judging, however, from the statistics given as regards the Kurnool district, the total mortality among cattle does not appear to exceed 9 per cent., a figure which, having regard to the rate of reproduction, is quite consistent with a rapid increase of stock.

The Government observes with satisfaction that there were no cases of cattle poisoning in Anantapur during the year. They agree with the Director that a fine of Rs. 15 is an inadequate punishment for deliberately poisoning a cattle-pond.

4. The results of the work of the department during the year, so far as they are shown in a report which is clearly not so complete as it might have been, cannot be regarded as satisfactory, but His Excellency in Council trusts that the work of the committee which he has recently appointed will furnish material for forming conclusions as to its real effect, and that the committee will be able to devise measures for making the expenditure of the State on agriculture of more direct benefit to the ryots than has been the case in the past.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Commissioner of Revenue Settlement, Land Records and Agriculture.
„ the Commissioners of Land Revenue.
„ the Government Botanist.
„ Secretary to the Committee apointed in G.O.,
25th September 1888, No. 686.

No. 872-A, Revenue.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) C. A. GALTON,
Secretary to Government.

REPORT

ON THE

OPERATIONS OF THE AGRICULTURAL DEPARTMENT,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1889-90.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1891.

PROCEEDINGS OF THE BOARD OF REVENUE

(Revenue Settlement, Land Records and Agriculture).

Mr. Clogstoun.

Resolution—dated 10th September 1890, No. 275-A.

The Board resolves to submit to Government its review of the operations of the Department of Land Records and Agriculture for the year 1889-90.

2. Mr. Wilson remained in charge of the department till the end of September, when he resigned the service, and was succeeded by Mr. Clogstoun, who returned from furlough to take up his appointment towards the end of October. There were no other changes amongst the superior officers of the Department. The Committee alluded to in paragraph 4 of the last report laid their report before the Government in May 1889 and final orders on it were received in July 1890, that is, after the close of the official year.

3. The Assistant Director's duties during the year were chiefly secretarial and as such cannot be detailed. He was called upon during the year to visit a number of the great cattle fairs held at different places in the Presidency with a view to his drawing up, jointly with the Inspector of Cattle Diseases, an account of the breeds of cattle in the Presidency. For this purpose he visited Madura and Sivaliperi (in Tinnevelly) during April, Avanáshi and Punganúr in May, the Tirupúr fair and the breeding herd of the Paleiyakota Pattegar in June, Tiruvannámalai in December and Srírangam in March. The change which occurred in the appointment of the Director of the Department prevented his visiting Mahadésvaravadai in October, and the Subramania fair in South Canara during November. After visiting the cattle fair at Punganúr in May he proceeded to Madanapalle to inspect the village registers of that taluk and early in July he visited Cuddapah to arrange for a uniform method of check of the newly prescribed village registers of statistics by the special establishment sanctioned for the purpose; afterwards he proceeded on a tour in Tinnevelly to set on foot an enquiry as to the system under which cotton is grown in that district. Then after visiting Dindigul to inspect the progress made by Mr. Caine, the Tobacco Specialist, and to settle the plan for operation there during the year under report, he proceeded to Vellore to conduct a trial of water-lifts competing for the prize of Rs. 200 offered by the Government, and returned to Madras early in August. He remained at head-quarters during the ensuing three months, except for brief visits to Bellary and Salem in connection with the agricultural shows. In November he was again deputed to inspect Mr. Caine's work and to arrange for the settlement of certain claims which had arisen in connection therewith. Early in December he was called upon to proceed to Bellary for the agricultural show, from which he only returned at the beginning of the Christmas holidays, having remained in the district for a few days after the conclusion of the show to inspect the working by the ryots of Messrs. Massey and Co.'s cotton-soil ploughs, which have been sold in considerable numbers there. After his return from Srírangam in January, nothing occurred to take the Assistant Director away from head-quarters until Dr. Voelcker came to Madras at the beginning of February in the course of the tour on which he was deputed by the Secretary of State to enquire into the best method of improving Indian agriculture by scientific means. He then accompanied Dr. Voelcker to Shiyáli, Madura, Coimbatore and Salem to show him something of the country and the conditions under which

agriculture is here carried on. At Salem he remained during the show, of which he, as Director of the Show-yard, had executive charge, and almost immediately on his return proceeded again to Dindigul and Tinnevelly to inspect Mr. Caine's work in connection with the tobacco experiments and that of the Agricultural Inspector engaged on the cotton enquiry. From this last tour he returned to Madras on March 8th and thereafter remained at head-quarters till the end of the year. Besides the ordinary secretarial duties which fall to him, Mr. Benson has been engaged in preparing a statistical atlas of the Presidency, somewhat on the lines of the Bombay atlas, and has completed the preliminary sketches of all the districts from Kistna southwards, except Tanjore, Nilgiris, Malabar and South Canara, as far as the information immediately available is concerned; and has carried those of the marginally-noted districts almost to completion, the chief work which remains to be completed being a determination of the areas on which the crops are protected during seasons of prolonged drought. For this, information is being collected.

Kurnool.	North Arcot.
Bellary.	Salem.
Anantapur.	Coimbatore.
Cuddapah.	

I.—Organization and maintenance of Village Records.

4. A full account has been given in the reports of the past two years of the steps taken from time to time to simplify the forms in which the village statistics are recorded and to improve the position of the village officers on whose efficiency the correct maintenance of these accounts chiefly depends. All Collectors report that the village accounts are fairly well kept and that they have been carefully scrutinized at the annual settlement (jamabandi). Since the date of the last report, the revision of village establishments has been sanctioned for South Arcot and Madura. The proposals relating to the Ganjam district have recently been submitted to Government and those for Cuddapah and Anantapur have been returned to the Collectors for revision. Since the close of the year the sanction of the Secretary of State has been received to the increase which had been repeatedly sought by the Local Government in the strength of the Revenue Inspector staff. This will enable the District officers to exercise a more efficient check than has hitherto been possible over the work of the village officers. The question of appointing a special officer as a Personal Assistant to the Director to supervise the work of the taluk and village establishments in connection with the maintenance of land records and survey marks was discussed during the year with the result that the Government has decided to recommend the appointment for the sanction of the Government of India.

5. Of the Revenue Inspectors now existing, some 400 have passed the Survey Test prescribed in G.O., dated 8th July 1885, No. 800, Revenue. This number includes 118 who passed the test in the year under report. In future, there will be 610 Revenue Inspectors on Rs. 40 and 35, instead of 525 on Rs. 30, 25 and 20 as hitherto.

II.—Analysis of Districts with reference to their Security from Famine.

6. *Kurnool.*—The analysis of this district, prepared by the Assistant Director, was submitted to Government during the year. It was reviewed by Government and published shortly after the year closed. It was not considered to have complied with the requirements of the Government of India, but as doubts existed as to what these requirements were, further instructions on the subject have been asked for and it is thought that when they are received, the work of analysing the village registers of statistics may for each district be entrusted to a Deputy Collector specially deputed for that purpose, working under the orders of Collectors.

7. *Cuddapah.*—The field work of the Agricultural Inspectors was completed in this district during June last, but the portion of the same work allotted to the Revenue Inspectors was not finished till considerably later on. The special establishment sanctioned to check and compare the village registers prepared in this district was working during the early part of the year, and it is reported that their work was completed in seven out of the eleven taluks of the district.

When the Assistant Director visited Cuddapah in July, he found that the check was not proceeding on any definite lines, and after further inquiry through the Agricultural Inspectors and after examining some of the registers of other districts which

were called for, the Board issued detailed instructions as to the method of checking the registers which should now proceed on a definite system. Owing to the doubts which had arisen as to what the Government of India actually required in these analyses (*vide* paragraph 10 of last report) all further detailed work in the Cuddapah district has been suspended till further orders.

8. *Other Districts.*—Owing to absence of proper village establishments, it was found necessary to abandon the idea of preparing the village registers for whole inam villages in the Ramnad and Sivaganga Zemindaris and also not to attempt to obtain figures for past years in the Pálkonda taluk of Vizagapatam, which has been under the management of Messrs. Arbuthnot and Co. as lessees for several years. The new settlement has just been introduced into this taluk and arrangements have been made for maintaining from the current year complete statistics of cultivation and revenue.

9. *Statistical Atlas.*—The preparation of an atlas bringing together the chief particulars regarding the economic condition of every district which are recorded in the annual statistics was put in hand during the year. This work was, as already noted, entrusted to the Assistant Director, when the Agricultural Inspectors who had completed their work in Cuddapah returned to head-quarters pending the issue of the orders anticipated from Government on the Agricultural Committee's Report. A completed sketch for Kurnool, together with a map to illustrate the memoir, was submitted to Government and received general approval; this has since been revised and completed as far as possible in accordance with the instructions of Government, and the work of preparing similar accounts of other districts has been carried nearly to completion in the case of all districts south of the Kistna. One great difficulty is however met with in preparing the maps and memoir, and that is in determining the area in which crops may be regarded as being practically safe in times of prolonged drought. Had the village records for the famine years 1876–78 been still available, this might have been easily determined, but notwithstanding strenuous endeavours, great delay may occur before these particulars are forthcoming even approximately.

10. The following table shows the progress made in all the districts up to the end of March 1890 in the preparation of the statistical registers ordered in connection with famine analysis:—

Districts.	Total number of villages, Government and Inam.	Number for which registers have been completed.	Number for which registers have been partially prepared.	Remarks.
Ganjam	1,528	205	148	
Vizagapatam		Completed.		
Godávari	1,370	1,138	211	
Kistna	1,359	1,065	288	
Nellore	931	867	* 21	* Section V only wanting for 16 villages.
Anantapur		Completed.		
Bellary	1,562	1,537	...	
Cuddapah		Completed.		
Kurnool	789	290	75	
Chingleput	1,767	1,712	17	
North Arcot	1,756	1,608	107	
South Arcot	3,214	2,801	167	
Tanjore	3,661	2,298	...	
Trichinopoly		Completed.		
Madura	2,818	320	160	
Tinnevelly	1,104	1,083	9	
Coimbatore		Completed.		
Salem		Do.		
Nílgiris		Do.		
South Canara		Not required.		
Malabar				

The registers have been completed in seven out of the nineteen districts for which they are required. In four they are nearly finished, and in four more their preparation is far advanced. The progress has been very slow in Ganjam, owing to the prevalence of famine; and also in Kurnool, where the preparation of the registers was not commenced for some months under a misapprehension on the part of the local officers that the analysis prepared by Mr. Benson supplied all the information that was wanted. In Madura the work was delayed owing to the progress of settlement operations.

III.—Collection of Revenue and Rental in Precarious Tracts.

11. The revised kistbandi (instalments of revenue), sanctioned in G.O., dated 20th October 1888, No. 724, and referred to in paragraph 11 of the last year's report, was found to be working on the whole very satisfactorily and to be well suited to the conditions of the several districts.

12. Slight modifications were made in four districts, Anantapur, Nellore, Tanjore and Malabar. In Anantapur, the last instalment was put back by one month, that is, from April to March. In Nellore, the two sets of instalments prescribed for the Northern and Southern portions of the district were made to begin from January and February, respectively, instead of from December and January. In Tanjore, a slight reduction was made in the number of instalments from 8 to 7; those for the kar or early crop paddy being fixed at 3, 6 and 7 annas beginning from December, and those for the samba or late paddy crop comprising four instalments of 2, 4, 6 and 4 annas and beginning from February. This change was ordered to take effect from fasli 1300 (1890-91). In Malabar, the four instalments were made equal and put forward by one month, from November to December, by which time the ryots will have realised the value of their first paddy crops.

13. In G.O., dated 7th May 1889, No. 359, Government sanctioned the trial of a scheme proposed by the Postmaster-General enabling land-holders to pay the Government dues by post office money order. The scheme has been introduced experimentally into five districts of the Presidency.

IV.—Measures of Protection.

14. *Communications.*—That portion of the Bellary-Kistna State Railway running from Bezváda to Cumbum was opened during the year and progress was made with the intervening part connecting that portion with the main line at Nandyál. Work on the Villupuram-Dharmavaram Railway was vigorously prosecuted and sanction granted for its extension to Guntakal. A detailed survey for the East Coast Railway from Bezváda northwards was undertaken during the year, and a reconnaissance made for a railway from Nellore northwards.

15. *Irrigation.*—The Rushikulya works in Ganjam and the Periyár Project in Madura were in progress during the year. The amount expended on the former up to end of 1889, was Rs. 12,79,000 and on the latter Rs. 8,77,000 against an estimated outlay of Rs. 28,60,000 and Rs. 56,40,000, respectively. Capital and Revenue accounts have been hitherto kept for only 18 works, of which 10 were classed under major productive works, and the remaining 8 under minor works. Thirteen more works have been added to the list in view to Capital and Revenue accounts being kept for them also.

16. *Minor Irrigation Works.*—The repair of these works has been entrusted to Revenue officers since 1882 and during this period about 24½ lakhs of rupees have been expended towards their improvement. In the year under review, the expenditure amounted to Rs. 3,58,400 or 95 per cent. of the allotment (3¾ lakhs).

17. *Advances to Agriculturists.*—The administration of advances under the Land Improvement and Agriculturists' Loans Acts is at present vested in the Land Revenue Department of the Board of Revenue, and the question of transferring it and the

control of the Minor Irrigation works to this department is now under consideration. The following table shows the amounts of the advances made under the two Acts during the past five years :—

Year.	Land Improvement Loans Act.		Agriculturists' Loans Act.	
	Budget allotment.	Actual loans.	Budget allotment.	Actual loans.
	RS.	RS.	RS.	RS.
1885-86	2,00,000	2,925	..	..
1886-87	2,00,000	8,057	1,00,000	19,100
1887-88	2,00,000	77,507	1,00,000	40,034
1888-89	2,00,000	1,30,622	1,00,000	36,772
1889-90	1,50,000	1,38,690	80,000	44,950

18. *Arts and Industries.*—No further investigations into the conditions of indigenous arts and industries were made during the year, nor did Mr. Havell publish any articles on the subject.

19. *Metals and Minerals.*—Mr. Bosworth Smith's report on the Kolar Gold Fields was published during the year. Of the samples of *Soapstone* alluded to in paragraph 21 of the last report, one obtained from Maddavaram in Kurnool was reported by Mr. F. R. Mallet to be suitable for manufacturing purposes, and an indent for 5 tons 2 cwts. of the same quality was received from the Secretary of State during the year. Arrangements have been made to meet the indent.

20. *Dhobie's earth.*—In the year 1888 the Government having before them the analyses of several samples of this substance submitted by Mr. Hooper, Government Quinologist, directed that an inquiry should be made as to the possibility of successfully establishing an industry in the manufacture of carbonate of soda from it. The results of the inquiry were reported during the year and showed that, although considerable quantities of carbonate of soda could probably be obtained in several districts, there was no prospect of the industry becoming established in them, and the Government did not consider that any expenditure in making experiments on a large scale would be justified to determine whether the manufacture would be successful as a commercial undertaking.

21. *Animal bones.*—The Government of India in its letter to the Madras Government, dated 4th October 1889, No. 67-A—112-1, drew attention to the increasing exports of animal bones and the drain, thereby threatened, of the manurial resources of the country, and desired that information should be furnished in the next annual report of the Agricultural Department, as far as possible, regarding the sources of export of bones, the extent to which bones are collected in the mofussil, their treatment before shipment, with any suggestions for the utilization of bones as manure in this country and a summary of any experiments which have been already made in this direction in previous years. The Board requested all Collectors to report on the points alluded to by the Government of India, and at the same time pointed out that the sea-borne trade statistics showed no increase in the export of bones from this Presidency in recent years, the average annual exports during the last four years, 1886—90, being 2,472 tons, whereas the average exports in the two previous years, 1884—86, were 3,528 tons. This diminution in the exports appeared to be due to the fact that Ceylon, which formerly obtained most of its bone supply from this Presidency, is now getting large supplies from Australia.

22. The reports received from the Collectors show that bones are not generally used as manure except on coffee plantations on the Nílgiris, the Shevaroy hills and in parts of Tinnevelly and Malabar. In the Tanjore district, bone manure is said to be occasionally applied to cocoanut trees, and in South Canara the bones are sometimes buried in their raw state at the foot of indifferent jack and cocoanut trees. The bulk of the bones collected is exported chiefly to Ceylon and, to a small extent, to the United Kingdom. The largest quantity is sent from Tinnevelly and Malabar, about 1,200 tons and 2,000 tons, respectively. Ganjam, Kistna, the Ceded Districts and Kurnool show very small exports, the largest quantity being only about 40 tons from

Cuddapah. Godávari exports from 340 to 430 tons annually, and Vizagapatam from 100 to 250 tons, Nellore following with about 100 tons on an average. Most of the southern districts export about 150 to 200 tons. In Madras, a single dealer has been exporting about 200 tons annually to Ceylon during the last 10 or 15 years.

23. In all parts of the Presidency, bones are collected by chucklers, pariahs and other low-caste men who dispose of the carcases of cattle. The bones of sheep and goats are not collected in some parts, because they are light and do not sufficiently pay the cost of collection. The bones thus collected, are sold in Sea Coast districts to dealers at the rate of about 2 annas per Madras maund, equivalent to about Rs. 11 per ton. The dealers sell the bones in their turn to shippers. On the Nílgiris, raw bones are delivered by contractors at a cost of Rs. 30 to 33 per ton. The cost of bone dust on the Nílgiris varies from Rs. 45 to as much as Rs. 70 per ton, according to situation.

24. The treatment to which the bones are subjected before exportation appears generally to consist in simply drying them and breaking them by hand. In Malabar and to a small extent in South Canara also, however, they are crushed by machinery and converted into meal for use as manure, being generally steamed first.

25. Bones are rendered more active as manure by being mixed with lime, saltpetre, cattle manure, oil-cake or sulphuric acid as well as by disintegration, steaming and reduction to ash.

26. The following is an account of a few experiments made with bones in this Presidency.

In 1880-81, Mr. C. Krishnasami Mudaliar of Shiyáli applied to half an acre of wet land not previously manured 375 lb. of bone ash at the time of transplanting paddy seedlings, the cultivation and irrigation being as usual. An adjoining plot of one acre likewise unmanured previously was cultivated with paddy without any manure. The outturn on the plot manured with bone ash was 720 Madras measures of paddy and 1,260 lb. of straw or 1,440 Madras measures of grain (equal to 3,150 lb.) and 2,520 lb. of straw per acre. The outturn on the unmanured plot of one acre was 828 Madras measures of grain (equal to 1,811 lb.) and 2,352 lb. of straw. The increase in the outturn of grain due to bone ash is thus apparently 1,339 lb. per acre, which is equal to the average outturn of paddy per acre in the whole Presidency.

In April 1888, Mr. Lawson, Government Botanist, mixed with bones coarsely powdered, 10 per cent. of their weight of sulphuric acid and applied the manure (quantity not known) to a plot of cinchona. The bark of the trees thus dealt with was taken twelve months later on, and on being compared with the bark of the trees which had been subjected to ordinary treatment, it was found that the alkaloids exhibited a marked improvement.

On the Saidápet Farm, experiments were several times made with bone-charcoal which, when mixed with oil-cake and decomposed, gave good results. But how far the increase of produce was due to bone-charcoal itself was not definitely determined.

It appears from a report of the Tahsildar of Adóni, that, some years ago at Harpanahalli, bones were broken to pieces, burned, and used as manure with good results ; but the ryots do not care to use bones as manure since the above-mentioned process of preparing them is laborious. In the Chingleput district, the zemindar of Vangul tried bones as manure, but it appears that he had not much success.

Mr. Gray, a Coffee planter on the Nílgiris, says that he has found by experience that an application of 5 cwts. of bones to an acre gives on an average an increased crop of 2 cwts. of coffee.

In the sugar factories at Aska, Nellikuppam, and Tuticorin, considerable quantities of bones are consumed as bone-charcoal.

V.—Agricultural Experiments.

27. *Farms.*—The Madura Farm still continues to exist, but no longer receives any aid from the department. No direct farming operations of any sort were carried on by the department during the year.

28. *Tobacco experiments.*—The reports obtained locally on the tobacco cured by Mr. Caine in the season of 1888-89 showed that the results were far from successful, some of the leaf having been cut too late and some too early. Samples of leaf were

sent to England for the opinion of experts which has since been received. The reports of the home brokers and manufacturers showed some remarkable difference of opinion as to the value and quality of the samples sent, but they were on the whole unfavorable. It was thought, however, that the samples exhibited a very decided improvement in growth and curing over previous samples sent from India, and the Secretary of State for India considered that the reports seemed to afford encouragement to the efforts which were being made to improve the cultivation of tobacco in the Presidency.

It was proposed during the year under report to commence a series of experiments in the Godávari district in the curing of Lunkah leaf as pipe tobacco, and in order to set Mr. Caine free at Vedasandur, an Agricultural Inspector was deputed to work under him there to learn the routine, it being thought that Mr. Caine would then be able to go to Godávari in February last. From various causes, however, the planting in the season of 1889-90 was late, and as it was found that Mr. Caine could not safely leave Vedasandur before March, the proposed experiments in Godávari were abandoned, and Mr. Caine's efforts were concentrated at Vedasandur. The results of the further experiments conducted there have been found to be most disappointing. About 2 acres were planted with the Sumatra, Havanna, and two of the indigenous, varieties.and the tobacco after being cut was cured in closed sheds under Mr. Caine's personal supervision. Samples of the cured leaf were sent to four of the local firms, three of which have favored the Board with their opinion which is almost uniformly unfavorable. The leaf of the Sumatra and big Havanna is stated by Mr. Heimpel to be "coarse, thick and of low quality," and by Messrs. McDowell and Co. "to be not useful as a covering leaf, being extremley thick;" they add that its smell is scarcely perceptible and that it smokes with a black ash. Messrs. Spencer and Co. state regarding the same leaf that it does not burn well, is not suitable for cigar wrappers and has not sufficient flavor for fillers. No estimate is given of its market value by Messrs. Spencer and Co. Messrs. McDowell and Co. appraise it at from Rs. 6 to Rs. 10 per maund, but Mr. Heimpel gives no market value either for the Sumatra or for the indigenous tobacco on the ground that the leaf is of too low a character for cigar and unfit for the work done in the firm. Mr. Caine's own opinion indeed of the Sumatra tobacco fully bears out the above estimates. The big Havanna should, he thinks, be acclimatized as the leaf grown was of good texture and color though he adds that the leaf does not burn and possesses but little value on that account. The texture, quality and flavor of the indigenous leaf grown by Mr. Caine are, Mr. Heimpel states, "much below the classes of tobacco grown by the firm in that district though it shows an improvement." Messrs. Spencer and Co. are of opinion that the color of the leaf is good as an outside covering wrapper though they considered that in flavor it is "decidedly wanting owing to insufficient fermentation." Messrs. McDowell and Co. find the flavor "not pleasant."

The total weight of the tobacco after curing was 2,880½ lb., of which 1,442 lb. were indigenous tobacco, 1,027 lb. Sumatra, 314½ Big Havanna and 97 the Small Havanna. Excluding 23¾ lb. sent as samples to different firms for opinion, 1,418¼ lb. of indigenous tobacco were sold for Rs. 158-8-3, though Mr. Caine estimated the value of his crop at Rs. 150 per pothi of 320 lb. The whole of the foreign tobacco, 1,409 lb., exclusive of 29½ lb. distributed as samples, was also sold on the recommendation of Mr. Caine as it would not keep. It realized Rs. 35-5-3 only.

29. *Cotton enquiry.*—Acting on a suggestion made by Mr. Nicholson in his note laid before the Agricultural Committee, an enquiry was set on foot during the year to determine why the outturn of cotton in Tinnevelly is so much lower than that obtained in America. The district was chosen because it is one of the largest cotton-producing areas in the Presidency and the cotton grown there commands a higher price than that produced in any other part of this Presidency. The enquiry during the year has been chiefly directed to ascertaining and recording in full detail the conditions under which the crop is now grown with a view to determining any direction in which experiment as to improvement may be possible. An Agricultural Inspector was detailed for this work in July 1889, and was engaged for 10 months at Sátúr in collecting information of the nature referred to in several selected villages.

30. The results of the inquiry are on the whole satisfactory. They show—

(1) That the growth of cotton in Tinnevelly under the influence of recent high prices is a very profitable undertaking. The price of uncleaned cotton was once, the Inspector says, so low as Rs. 7 per Pothi of 320 lb., and it has now increased three or four fold. This increase in the price has acted as a stimulus not only to extend the area under cotton, but also to increase the outturn per acre.

(2) That the yield is very satisfactory and the quality of the cotton superior. The average yield of clean lint per acre is said to be about 125 lb., which compares not unfavorably with the average yield of the United States which is given in the Tenth United States Census Report (Cotton) at 189 lb. per acre, varying in the three typical Cotton States of Georgia, North Carolina and Arkansas from 148 lb. to 277 lb. The seasons during which the inquiry was conducted were, however, very favorable for cotton.

(3) That there has been no falling off in the outturn of late years, but rather the contrary. The ryots themselves admit that the outturn of cotton is somewhat larger now than it was formerly. The increase in the outturn is attributed by the Agricultural Inspector (1) to the recent practice of adding various kinds of earthy matter to manure heaps which are thereby not only increased in quantity, but also become better decomposed, and (2) to the greater care and attention now bestowed in tilling the lands and clearing them of weeds.

There are but few lines suggested for experiment by the Agricultural Inspector's report, by which it might be hoped that the outturn could be further increased. In an important point, however, viz., in selection of seed, sufficient attention does not appear to be paid at present. Some improvement seems also possible in regard to sowing and weeding. Except in these respects, the report indicates that the Tinnevelly cotton soil ryot is far more advanced than most of his compeers in the Ceded Districts and Kurnool.

31. In order to collect and tabulate the information available in the country as to the quality of the different cottons produced in the Presidency, a circular was addressed early in the year to the principal firms and merchants engaged in the cotton trade propounding a series of questions bearing on the subject. Their replies have been received and after being collated with the information available in the Board's records, have been published in the form of a bulletin (No. 9) as a first step towards more detailed investigation of the nature of that commenced in Tinnevelly. Attention having been drawn to the great development of the cotton-seed oil industry in the United States of late years, endeavours were made during the year to obtain data as to the possibility of such an enterprise being started in India, but without success. The question appears to be one well worthy of scientific enquiry and experiment, for the amount of cotton-seed produced annually is very large, and cotton-seed oil is highly valued in Europe and America.

32. At the request of a private individual 3 cwts. of cotton-seed were obtained from Egypt by the assistance of the Chamber of Commerce, Bombay, for experimental sowing on the Permedi hills of Travancore.

33. The postponed award of prizes for crops of barley raised on the Nílgiris from the seed imported by Government in 1888 was made during the year, but it was found necessary to give up the idea of making the award on a system of field competitions as originally intended. The prizes were awarded to specimens of the grain received for weight, color and uniformity, and for careful harvesting. The grain has been found to malt very well and though the outturn of the plots which produced the prize-winning samples was in no case high, the results were fairly satisfactory. The Government prizes were supplemented by grants from the brewing companies working on the hills. The system of giving prizes for samples is to be continued.

34. The seed-oats referred to in paragraph 29 of the last report having arrived on the hills too late for the last season's sowings, became damaged by keeping and the results of the sowings in the season of 1890 were anything but satisfactory. The growth of oats for green fodder is, however, an established industry on the hills, and further experiments appear to be uncalled for in the matter.

35. *Eucalyptus.*—The reports on the experiments made with the seeds of a number of varieties of *Eucalyptus* imported in 1888 which were received during the year were

not very satisfactory or encouraging. In a few places, by the exercise of special care, a few plants have been reared, which grow slowly and poorly, but the general result has been to show that in the plains these plants, although the seed may germinate freely, rot off very soon and but few can be reared, and probably the belief of the Conservator of Forests, Northern Circle, that it is of little use to attempt to acclimatise them is fully justified; at any rate these arboricultural experiments may well be left to the Forest Department in future.

36. *Erythroxylon Coca.*—The reports received during the year show that the plants distributed in 1888-89 have for the most part done well except in Ganjam and Vizagapatam, and the experiment, as far as it has yet gone, shows that it is possible to propagate this valuable plant, if reasonable care be taken of it under the conditions specified last year. It is, however, too early as yet to state what the value of the leaf produced under the conditions met with in this Presidency will be. This point is being investigated.

37. *Salt bush.*—Enquiries instituted during the year as to the natural habitat of the Australian salt bush, which it was once hoped might be usefully introduced as a fodder plant to be raised in the marshy saline land found in the coast districts, revealed the fact that the natural habitat of this plant is an arid desert country. Further investigations as to whether any plants could be found in this country which correspond in their character to the Australian salt bush, showed that although there is a considerable number which flourish in saline marshes and similar localities, there are none that correspond in their habits and character with it.

38. *Sugar and Jaggery.*—A suggestion that the Government, with a view to improving the quality of sugar produced in India, should start large model factories for the manufacture of "modern sugar" was received from the Government of India during the year for report, but it was pointed out that in most localities the conditions met with rendered the idea impracticable, and that if there was really an opening for the enterprise, it would be embarked in at once by the commercial community. In connection with this discussion a most interesting and valuable communication was received later from Mr. Francis M. G. Gill giving actual data as to the quality of the jaggery produced in Southern India and the composition of the canes from which it is produced, which go to show that much of the inferiority of the jaggery at present turned out is due either to the ryots growing poor varieties of sugarcane, or from their cutting the cane when it is not fully ripe.

Reports received during the year indicate that in Vizagapatam the sugarcane industry is declining as the quality of the jaggery is falling off owing to careless manufacture and adulteration. These might both be guarded against by a little more care and honesty than is now shown in the manufacture, and the attention of growers has been drawn to the fact.

39. *Economic Entomology.*—No opportunities occurred during the year to enable the gentlemen who undertook to make experiments in the use of London purple as an insecticide to utilize the supply sent to them during the year, there having been a very marked absence of serious insect attacks. Locusts, however, appeared to a very small extent in Godávari and Vizagapatam and have done some damage there. Those which appeared in Vizagapatam have been identified as the *Acridium peregrinum.* Specimens of the locusts which appeared in Godávari were sent to the Superintendent, Government Central Museum, for identification.

Specimens of the locusts which appeared in the Presidency in 1878-79 were sent by Dr. Thurston to Mr. Cotes of the Indian Museum for identification and that officer reports that the specimens consist of six different species, and that they were forwarded to Dr. Henri de Saussure who determined them as follows:—

(1) Acridium æruginosum.
(2) Acridium melanocorne *var.*
(3) Tryxalis turrita.
(4) Mecopoda sp—.
(5) Euprepocnemis sp—and
(6) Pachytylus migratorius?

The last-named species could not be identified with certainty, as it was represented by a single dilapidated specimen. Mr. Cotes has asked the Superintendent, Central Museum, for a sufficient number of specimens of the last-named species, to enable him to identify it. He believes that *Pachytylus migratorius* is almost entirely

confined to the Polœarctic Zone. Of the locusts which appeared in 1878, it appears that there was one migratory species which came in vast flight and did most of the injury, the other non-migratory species being very much smaller in number though helping to a greater or less extent in the work of destruction. The first five species above mentioned were non-migratory.

40. *Sericulture.*—The investigations of the special officer appointed to organize the collection of cocoons of the tassah silk moth in the Chingleput district were brought to an end in June 1889. Owing to a misconception of the instructions issued by the department, he was not properly directed to his work and it was only in March 1889 that he commenced the collection of cocoons. The report submitted did nothing to show the cost of collecting such cocoons, the chief point that it was desired to clear up. It contained, however, a large amount of valuable information regarding the habits of the tassah silk worm and regarding its natural enemies, and may form a basis for future useful work. The Government has since decided that an attempt should be made to rear tassah silk worms, and has transferred further operations in this direction to the Forest Department.

41. *Exhibitions.*—The fourth show of the series held in recent years in that locality was opened at Bellary on the 18th December 1889. It was organized on much the same lines as those of the previous years, but the prize list had been recast. As a whole the show was not successful; there was a falling off in the number of exhibits from 1,049 in the previous year to 861, the decrease being most marked amongst live stock—from 362 to 185; and there was a decrease in the proportion of the amount granted as prizes from 70 to 58 per cent. The total cost of the show was Rs. 4,037-9-0, of which nearly 67 per cent. was awarded in prizes. A similar show was also held at Salem in February last, which though more successful was not altogether satisfactory. There also there was a decrease in the number of live stock exhibited. At this show the proportion of the money offered in prizes that was awarded was 59·5 per cent. against 81 per cent. at the previous show. It cost Rs. 5,934-6-0, of which 66 per cent. was allotted in prizes. The system of mofussil shows, of which these two are the latest, has been practically abandoned pending the orders of Government on the Agricultural Committee's report. The want of much success at them, and the absence of any genuine interest amongst the ryots in them shows that the system needs revision.

42. *Agricultural implements.*—During the year the department sent out no parties to exhibit implements in the mofussil, but Messrs. Massey and Co. organized a party which visited South Arcot, Trichinopoly, and Coimbatore, exhibiting ploughs and sugarcane mills at work and repairing and renewing the wearing parts of previously sold implements when produced. The demonstrations, Messrs. Massey and Co. say, were not a success, as the ryots were unwilling to buy efficient ploughs costing more than Rs. 4 or 5 nor efficient sugarcane mills costing more than Rs. 100 each. From the fact, however, that Messrs. Massey and Co. received numerous orders for spare shares and that many former purchasers of ploughs visited their works and bought ploughs for extended operations, it is believed that a good number of improved ploughs are in actual work. The demand is usually for Cotton-soil ploughs, E. P. plough, and Climax plough, the latter apparently suiting the requirements of the ryots owning small cattle. Messrs. Massey and Co. report that they have now invented a steel share tip whereby the cost of shares is considerably reduced. The share tip is said to be appreciated by the ryots, to be durable, and capable of being easily secured to the original share.

43. During a visit to the Bellary district, the Assistant Director made enquiries as to the manner in which the Cotton-soil ploughs made by Messrs. Massey and Co. did the work for which they are designed and reports that except for a few minor defects, which it is believed have since been corrected, the ploughs work to the satisfaction of the ryots, and are found to effect a great saving of labor over that required for the *pedda madaka* or large native plough heretofore used. Messrs. Massey and Co. are believed to have sold a considerable number of these ploughs in the Anantapur and Bellary districts.

44. The deferred trial for the award of the prize of Rs. 200 offered by the Government in 1888 for the best water-lift was held at Vellore in August last, when only two lifts competed, although there had been six entries for the prize. One of these was submitted to a prolonged trial, but the judges at length came to the conclusion that it did

not fulfil the conditions prescribed by the Government. At the Salem exhibition held in February last a new water-lift was brought out, but it is complicated and has yet to be thoroughly tested before it can be pronounced upon. A similar remark may be made as regards a lift designed by Mr. C. K. Subba Row, Sub-Assistant Director, intended to supersede the working Single Mhote.

45. At the Bellary exhibition some Cream Separators were shown by a party sent out by the Dairy Supply Company, London. This display was repeated in Madras with the assistance of the department, but it does not appear that these demonstrations led to any business being done. The machines appear to be unsuited to the conditions under which the milk supply of towns is at present carried on in this part of India.

46. *Economic products.*—Specimens of the silk cotton obtained from the *Bombax Malabaricum* were forwarded from nineteen districts to the Indian Museum during the year at the requisition of the Government of India, as well as samples of cocoanut coir, and of the materials made from it from three districts and from Travancore; samples of grass and sedge mats and the fibres used for making them from four districts; of Sunn hemp (the fibre of the *Crotalaria juncea*) from three districts; and single specimens of fibres prepared from the *Calatropis gigantea*, the *Yucca gloriosa* and of khaskas (*Andropogom muricata*). These specimens were indented for to meet the requirements of the Secretary of State and for the Imperial Institute.

47. Detailed information was forwarded during the year to the Government of India regarding a variety of economic products for the use of the Economic Reporter.

48. At the suggestion of a firm engaged in brush manufacture in England, samples of several fibres believed to be likely to be of use to the trade were forwarded during the year to Mr. W. R. Robertson who brought the matter to notice, but as yet nothing further has been heard regarding them. Similarly at the request of a firm of Horticulturists several samples of tobacco obtained from Cuddapah and Kistna were forwarded to them for experiment as they considered that this might enable them to determine whether such tobacco could be turned to account in their business.

49. At the request of the Consul-General in Calcutta for the United States, specimens of forty-four varieties of sorghum (cholum) seed were collected from the Kistna, Kurnool, Coimbatore and Madura districts and forwarded to him during the year for transmission to America for experimental purposes. These samples embraced varieties of the red, black, yellow and white cholums grown in the districts referred to.

50. *Agricultural Proverbs.*—In order to supplement the collection of proverbs bearing on matters connected with agriculture which was made by Mr. Benson during the preparation of his account of the Kurnool district, the Board, in September 1888, issued a list of those embodied in the account to all Collectors with a request that similar collections might be made for every district. During the year a large number of collections were received which have since been collated and arranged and will shortly be published with notes and explanations.

51. *Societies.*—At the instance of the Government of India, the Director has been appointed an *ex-officio* member of the Managing-Committee of the Madras Agri-Horticultural Society. The Society note the propagation of a few plants of economic value, but otherwise there is nothing calling for special notice in this report. The contribution of Government to their support was Rs. 4,000.

A report was received during the year stating that an Agricultural Society for the collection of information and for carrying out experiments had been formed at Sátúr in Tinnevelly.

VI.—Cattle Breeding and Veterinary Establishment.

52. *Cattle.*—An inquiry was made by the Assistant Director and the Inspector of Cattle Diseases during the year to determine the chief cattle-breeding grounds in the Presidency. The inquiry extended to all parts of the Presidency lying to the south of the Kistna, except the West Coast, and the results, with a brief description of the different breeds of cattle met with, have been published in the form of a separate Bulletin (No. 8).

53. *Fodders.*—A very useful series of analyses of South Indian fodders made by Dr. Van Geyzel, Chemical Examiner, was published during the year, together with a

note on the results shown therein. Owing to the time and trouble involved and to the pressure of other work on the Chemical Examiner, it was not considered advisable to ask that officer to carry on this investigation further, and the matter has been allowed to stand over.

An interesting report was received early in the year from the Sub-Assistant Director regarding the practice which prevails in the Tinnevelly district of growing cholum for fodder, in the course of which he made several suggestions for the development of the practice. It was decided, however, to defer any action thereon pending the issue of the orders of Government on the report of the Agricultural Committee.

54. *Ensilage.*—Experiments in making this were carried out in the Kistna, Trichinopoly, Tanjore and Tinnevelly districts during 1889. In Kistna the results were fairly successful and the cattle fed on the silage throve. In Trichinopoly also fair results were obtained, the silage being good and readily eaten, but in Tanjore the result was not satisfactory, the persons who tried the silage not approving of it. In the Tinnevelly experiment, there was great loss from damaged silage, but the good silage was appreciated. The experiments failed, however, to clear up any of the moot-points connected with the question whether the practice of making silage is economical in Southern India.

55. *Pony-breeding.*—At the beginning of the year six stallions were stationed in Coimbatore, one on the Nílgiris and three in Salem. One of the first lot was sold during the year as being unfit for work. The stallion at first stationed on the Nílgiris was transferred to Coimbatore and replaced by a smaller one. During the year 305 mares were covered in Coimbatore, 14 on the Nílgiris and 115 in Salem, giving an increase of 54 mares covered as compared with the number covered in the previous year. There was, however, a serious falling off in Salem owing to the unfavorable character of the season, and very poor work was done on the Nílgiris.

The results of the coverings made in 1888 were reported during the year and showed that out of 375 coverings, the results were determinable in only 323 cases, of which only 86 or 26·6 per cent. were successful, a proportion slightly better than in the previous year, when only 70 out of 269 coverings, the results of which were known, were successful, a proportion of 26·02 per cent. The average number of foals per stallion was 8. The general average of produce foaled to mares covered by the stallions of the Government Horse-breeding Department in Bengal and Bombay and the number of produce foaled per stallion employed during the three years ending 1888-89, the latest for which information is available, are shown below:—

Year.	Average foaled to mares covered.		Number of produce foaled per stallion employed.	
	Bengal.	Bombay.	Bengal.	Bombay.
1886-87	34·44	34·55	12·67	10·41
1887-88	30·26	37·42	11·26	11·72
1888-89	31·05	37·32	10·75	13·78

The Madras results compare unfavorably with these. Recent inquiries, however, which have been made in Coimbatore showed that in the case of one stallion the actual results were better than first reported, no sufficient inquiry having been made in some cases before the results were reported. Care will be taken that this error is not repeated. The stallions are all well cared for and are in excellent condition, and it is hoped that future years with more careful registration will show better results.

56. Castration of country tats was carried on in Salem, Coimbatore and the Nílgiris, the total number castrated being in Salem 134, in Coimbatore 95, and on the Nílgiris 25. In the Nílgiris it was found that the work made no progress and it has now been abandoned there.

57. *Cattle disease.*—Mr. E. H. Hazelton, A.V.D., was throughout the year in charge of the operations of the department devoted to the prevention of cattle disease. His report is appended and is noticed more fully below. The Sub-Assistant Director

worked under his orders from the beginning of the year till February, when he proceeded on privilege leave. He had working under him at the beginning of the year 16 Stock Inspectors and 5 Probationers, and at the end of it 17 Stock Inspectors. Cattle disease, though happily of a much less severe type than that met with during the two previous years, prevailed to a greater or less extent in all parts of the Presidency, those districts which are reported to have suffered most severely being Ganjam, Kistna, Kurnool, Cuddapah, North Arcot, Chingleput, South Arcot and Malabar. Statements are given in the appendix showing the mortality both for the whole Presidency and districtwar, for each class of stock, as well as diagrams illustrating the mortality of horned cattle.

58. The following is an abstract of the losses recorded for the whole Presidency during the past 3 years for all descriptions of stock:—

Causes of death.	Mortality during the years ending 31st March amongst								
	Cattle.			Sheep and goats.			Horses and ponies.		
	1887-88.	1888-89.	1889-90.	1887-88.	1888-89.	1889-90.	1887-88.	1888-89.	1889-90.
Diseases.									
Rinderpest	116,553	95,795	38,252	5,180	4,075	4,492	..	..	..
Diarrhœa and dysentery	3,966	47,946	30,368	959	4,363	5,040	2	5	6
Total ..	120,524	143,741	68,620	6,139	8,438	9,532	..	..	..
Anthrax	34,432	19,893	22,502	1,816	3,253	5,654	3	5	9
Foot-and-mouth ..	2,763	5,269	7,811	211	989	2,836	..	..	..
Variola	733	2,841	3,290	3,373	7,387	7,962	..	1	4
All others	15,771	24,529	26,243	5,430	9,212	13,615	34	88	134
Total ..	174,223	196,264	128,466	16,969	29,279	39,599	39	99	153
Other causes.									
Natural decay ..	33,535	129,471	163,848	5,851	30,174	40,699	11	256	484
Accidents	45,857	9,072	22,114	20,106	11,608	11,815	59	68	66
Snake-bites	1,824	2,587	2,895	78	241	329	2	11	10
Wild animals	7,591	9,520	10,517	3,609	7,364	9,050	29	96	130
Poisoning	44	22	15	..	..	2	..	..	..
Total ..	88,851	150,672	199,389	29,644	49,387	61,895	101	431	690
Grand Total ..	263,074	346,936	327,855	46,613	78,666	101,494	140	530	843

It may be safely asserted that to improved registration is due a great deal of the increase under sheep and goats and ponies and horses, whilst the falling off under the head of "cattle" would probably have been greater but for the same reason. The latter decrease is very marked and very satisfactory; but notwithstanding, the total loss to the ryot community during the year from disease mostly preventible on the usual lines of calculation was not less than $13\frac{1}{4}$ lakhs of rupees. The decreased loss compared with the previous year was nearly $6\frac{3}{4}$ lakhs.

Taking the live-stock of the Presidency to be in round numbers 13,700,000 horned cattle, 11,400,000 sheep and goats and 40,000 horses and ponies, the rate of mortality per mille reported during the year was—

	From disease.		From natural causes.		From all causes.	
	1888-89.	1889-90.	1888-89.	1889-90.	1888-89.	1889-90.
Horned cattle	14·0	9·3	11·3	14·6	25·3	23·9
Sheep and goats	2·6	3·5	4·3	5·4	6·9	8·9
Horses and ponies	2·5	3·8	10·7	17·5	13·2	21·3

These figures for the reasons pointed out last year show that the mortality as reported to the department is enormously under-stated. They also appear to show that there

has been an improvement in the registration, the death-rate from natural causes having risen amongst cattle from 11·3 to 14·6 per mille, amongst sheep and goats from 4·3 to 5·4, and amongst horses and ponies from 10·7 to 17·5. The deaths reported to the department do not include those of animals slaughtered for food, a fact which may in part account for the lower death-rate amongst sheep and goats. An inspection of the districtwar figures appears to show that registration is particularly bad in Nellore, Cuddapah, South Arcot, Madura, Coimbatore, and most of all in Salem.

59. As noted in the last report, disease, and especially rinderpest, which had been most destructive for about two years, was showing a considerable decrease towards the end of the previous year. This decrease continued almost uninterruptedly in the past year from April to July, after which there was at first a gradually and then a considerably increased mortality until the maximum for the year was reached in October. From October onwards, the mortality of cattle from disease fell off rapidly until in February and March it only slightly exceeded 8,000 head a month, a figure lower than it had ever been since July 1887, when a monthly death-rate of over 10,000 was first reached. If allowance be made for presumably increased accuracy of registration, the falling off in mortality is very marked and satisfactory. The mortality from rinderpest followed almost the same fluctuations and never reached the appalling numbers of the previous 18 months. It will be noticed however that the number of deaths attributed to rinderpest, diarrhœa and dysentery taken together has not during the year under reference borne nearly so large a proportion to the total number of deaths as in the previous years, having fallen from about 70 to a little over 50 per cent. of the total. As compared with the returns for 1888-89, there was a most marked increase under foot-and-mouth disease and under diseases unspecified which bear to the latter nearly double the proportion they did to the total in the former year, whilst both anthrax and variola showed not only a relatively, but also an actually increased destructiveness. Part of this may be due to inaccuracy of reporting actual deaths from rinderpest being attributable to some other cause owing to a desire on the part of village officers to avoid drawing attention to their villages and thus incurring the risk of visits from the Stock Inspectors. Whilst therefore the cattle plague has shown decreased destructiveness, the number of deaths from other diseases has considerably increased.

The districts which have suffered most from rinderpest, diarrhœa and dysentery (taken together) are Kistna, Kurnool, North Arcot, South Arcot and Malabar. It is only in these districts that the mortality from these causes amongst cattle reached or exceeded 5,000 head; whilst in Cuddapah, Chingleput, Trichinopoly, Tanjore and Madura it reached 3,000 head per district. The great contrast in the losses from these causes is very clearly shown in diagram No. 2.

Anthrax is reported to have carried off 4,440 head of cattle in North Arcot, but in no other district did the mortality from this cause exceed 2,500, that figure being reached in Kistna, but nearly 2,400 cases were reported from South Arcot and about 2,200 from both Cuddapah and Chingleput. Tanjore reported nearly 1,900 deaths, and Anantapur, Kurnool and Ganjam each between 1,000 and 1,500 from this disease, but elsewhere it caused but few deaths. It was most destructive from June to October, or very much earlier in the year under notice than in 1888-89, whilst towards the end of the year the mortality fell away to a very low figure.

Foot-and-mouth disease is reported to have caused a very large number of deaths amongst cattle in Ganjam (2,393) and a considerable number in Trichinopoly (1,013); these two districts account for nearly half of the mortality reported from this disease throughout the Presidency. The disease seems also to have prevailed to a considerable degree in Nellore, Cuddapah and Anantapur, in North Arcot, Chingleput, South Arcot and Tanjore, in Tinnevelly and on the Western Coast, whilst no district escaped from it.

Variola is reported to have caused a remarkably large (1,267) number of deaths in Vizagapatam and a considerable number in Coimbatore, Cuddapah and Madura, and Ganjam, Godavári, Chingleput, South Arcot and Nílgiris escaped entirely from this disease and North Arcot and Tanjore very nearly so.

Unspecified diseases are reported most largely from Ganjam, Vizagapatam, Godávari and Kistna, whilst all districts, except North Arcot, Tanjore, Madura, Tinnevelly, Nílgiris and the West Coast, show considerable mortality under this heading.

60. Taken altogether the reported death-rate amongst horned cattle from disease only amounted to 9·3 per mille for the whole Presidency, that is, nearly 5 per mille less than in the previous year. The proportionate loss was however much greater in some than in other districts: Ganjam and Vizagapatam with 33 and 35 per mille show by far the heaviest proportionate loss and next to them come Kurnool (21), Chingleput (19), North Arcot (17), and then much lower down Kistna (11), Nellore, Anantapur and South Arcot (10), and Cuddapah and Trichinopoly (9). In the other districts the proportionate reported loss was small and in Salem and Godávari remarkably so.

61. The number of deaths reported amongst sheep and goats from disease has been rising rapidly during the three years referred to in the table given at paragraph 58, but it may be safely asserted that a great deal of this increase is due solely to improved registration. The losses from disease were heavy in the opening month of the year, but from May to September averaged about 2,000 a month only, in October and November the loss was doubled and trebled and during the remaining months was at a rate about 50 per cent. above that figure. During November some heavy losses from anthrax, chiefly in Godávari, Bellary and North Arcot, and from foot-and-mouth diseases, chiefly in Godávari, raised the death-rate, but in the whole year rather more than one-third of the loss was reported as due to unspecified diseases. The districts which showed the largest mortality were Anantapur, chiefly from sheep-pox, Bellary, chiefly from anthrax, and Cuddapah, chiefly from the above two causes combined, and Vizagapatam where also sheep-pox was very fatal. On the whole the last-named disease was by far the most destructive, with anthrax standing next. Diarrhœa and dysentery caused nearly as many deaths as anthrax and rinderpest. A few districts escaped disease almost entirely, viz., Tanjore, Salem, Nílgiris and the Western Coast, and in none, except Vizagapatam, was the death-rate per mille from disease high. It however appears that in both Ganjam and Vizagapatam there were great losses of stock (cattle and sheep) from disease. Much of this may no doubt be attributed to the reduced condition of the stock owing to the previous unfavorable season.

62. The mortality from disease reported amongst horses and ponies, although it showed a marked increase on that of the preceding year, was in reality altogether trifling and scarcely needs comment.

63. Nothing perhaps shows more clearly how much the registration of cattle mortality has improved in recent years than the great increase that there has been in the reported mortality of all descriptions of stock from causes other than disease. This has chiefly occurred under the sub-head "natural decay," for it is evident that in the first of the three years referred to in paragraph 58 many of those put down to "accidents" were erroneously classified. The mortality from snake-bites shows a slight increase in each year, as also does that from the ravages of wild beasts. The number of deaths caused by "accidents" during the past year is greatly increased by the losses which occurred in Ganjam during November owing to exposure during a cyclone, in which about 13,100 cattle and 5,900 sheep and goats perished. The mortality reported from "natural decay," although it reaches the high figures of 163,848 cattle, 40,699 sheep and goats, is not, in proportion to the number of stock known to exist in the Presidency, anything but extremely small. It only amounts to 12 per mille amongst the cattle and 3·5 per mille amongst the sheep and goats, whilst a reference to the detailed tables in the appendix shows that the report under this sub-head is extremely bad in some districts, *e.g.*, Salem (pre-eminently), Coimbatore, South Arcot, Cuddapah, Madura and Nellore, whilst in almost all there is evidently much yet to be done before even fairly accurate figures of the actual mortality amongst live-stock are forthcoming. These statistics take no note of the number of animals slaughtered at sacrifices or for human consumption.

64. During the year only 15 deaths of cattle from animal poisoning were reported against 22 in the preceding year—5 in Cuddapah, 2 in Madura, 3 in Bellary, 2 in Nellore, and 1 each in Vizagapatam, Anantapur and Tanjore.

In Vizagapatam, the offenders were sentenced to three months' rigorous imprisonment and a fine of Rs. 10 each. In Nellore, the offenders were not convicted for want of evidence. In Anantapur, the culprit was sentenced to four months' rigorous imprisonment. In Cuddapah, Bellary, Tanjore and Madura, it was suspected that the animals had been poisoned, but there was no evidence to prove it.

Among sheep and goats, there were only two deaths from animal poisoning reported from Anantapur, but what action was taken in the matter has not been stated by the Collector.

Part VII.—Miscellaneous Statistics.

65. *Rail-borne trade.*—The total trade registered during the year 1889-90 amounted to over 31¾ millions Indian maunds or nearly 2½ millions (8·4 per cent.) more than the trade of the previous year, as shown below :—

	1888-89.	1889-90.	Difference.	Percentage of increase or decrease.
	I. MDS.	I. MDS.	I. MDS.	
External trade—				
Imports into the Presidency	2,919,492	3,782,640	+ 863,148	+ 29·56
Exports from do.	3,684,020	4,311,465	+ 627,445	+ 17·03
Total ..	6,603,512	8,094,105	+ 1,490,593	+ 22·57
Internal trade	22,772,730	23,752,021	+ 979,291	+ 4·30
Grand Total ..	29,376,242	31,846,126	+ 2,469,884	+ 8·41

66. *The external trade.*—The trade of this Presidency with the other British Provinces and Native States was, as usual, chiefly confined to Mysore, Bombay and the Nizam's Territory as shown below :—

External blocks.	Imports, Percentage.	Exports, Percentage.
Mysore	63·30	66·27
Bombay	10·66	9·30
Nizam's Territory	18·45	23·98
Other blocks	7·59	·45
Total ...	100·00	100·00

The principal articles of import were grain and pulse, chiefly from Mysore (1,865,195 maunds); hides and skins (324,593 maunds); provisions (260,360 maunds); oil-seeds (397,575 maunds); dyes and tans (127,889 maunds); raw cotton (137,767 maunds) and sugar (155,109 maunds). The exports which were principally from the Madras Port consisted mainly of grain and pulse (879,250 maunds); salt (387,912 maunds); provisions (282,440 maunds); metals (152,890 maunds); sugar (139,649 maunds); coal and coke (383,124 maunds) and manufactured cotton (120,624 maunds).

67. The variations as compared with the trade of the previous year under some of the more important articles are shown below :—

Articles.	1888-89.	1889-90.	Difference.	Percentage.
	MDS.	MDS.	MDS.	MDS.
Imports.				
Grain and Pulse	1,270,397	1,865,195	+ 594,798	+ 46·82
Oil-seeds	223,639	397,575	+ 173,936	+ 77·77
Provisions	311,553	260,360	— 41,193	— 13·66
Spices	80,474	88,664	+ 8,190	+ 10·18
Sugar	108,444	155,109	+ 46,665	+ 43·03
Hides and Skins	331,529	324,593	— 6,936	— 2·09
Exports.				
Grain and Pulse	786,021	879,250	+ 93,229	+ 11·86
Provisions	243,782	282,440	+ 38,658	+ 15·86
Oil-seeds	70,060	99,998	+ 29,938	+ 42·73
Spices	46,714	69,772	+ 23,058	+ 49·36
Raw cotton	23,790	44,024	+ 20,234	+ 85·05
Coal and Coke	132,401	383,124	+ 250,723	+ 189·37
Metals	200,439	152,890	— 47,549	— 23·72
Oils	55,574	56,909	+ 1,335	+ 2·40
Sugar	172,920	139,649	— 33,271	— 19·25

68. *Internal trade.*—The trade within the Presidency was chiefly in grain and pulse which contributed 25·75 per cent. of the total trade. The percentages contributed by other principal articles were stone and lime 10·53, oil-seeds 10·25, salt 10·37, provisions 6·20 and sugar 5·76.

Road-borne trade.

69. *Interprovincial traffic.*—Under this head, the trade of this Presidency with the Central Provinces was registered at Kalingiyá. The long distance traffic or the traffic passing over a distance of 10 miles and upwards registered at this station was as follows:—

Registering station.	Inwards.			Outwards.		
	Goods.	Passengers.	Animals.	Goods.	Passengers.	Animals.
	I. mds.	no.	no.	I. mds.	no.	no.
Kalingiyá	97,285	1,833	754	28,425	2,290	15
Total ..	97,285	1,833	754	28,425	2,290	15

70. *Internal or Local trade.*—The following statement shows the lines of communication taken up for registration during the year under report and the long distance traffic registered on those lines:—

Internal or Local Trade, 1889-90.

Road.	Stations.	Goods.	Passengers.	Animals.
		I. mds.	no.	no.
Road No. 1 (*b*), the trunk road from the limits of the Senior Assistant Collector's charge in Ganjam to Chicacole.	(1) Pundi	787,969	314,966	2,061
	(2) Naupada	221,616	24,388	595
	(3) Narasannapet ..	596,988	323,556	..
Road No. 4.—Trunk road from Chicacole to the junction of the Vizianagrum-Bimlipatam road.	(1) Natavalsa	377,369	163,829	12,423
Road No. 5.—Vizianagrum to Vizagapatam	(1) Chittivalsa	1,240,189	174,670	8,065
	(2) Boddavalsa	1,348,688	197,950	9,323
	(3) Vemalavalsa	1,005,747	223,393	813
Road No. 6.—Bimlipatam and Vizagapatam to Tuni ..	(1) Pendur	790,483	120,517	15,060
	(2) Anakápalle	860,921	286,697	6,095
	(3) Timmapuram ..	952,787	310,732	22,583
Road No. 9.—Tuni to Rajahmundry and Cocanada ..	(1) Kattipudi	908,037	118,171	15,249
	(2) Jangampet	443,077	59,000	342
	(3) Rajanagaram ..	1,211,945	140,472	5,453
	(4) Rajahmundry ..	1,920,106	198,097	1,364
	(5) Sámalkót	1,905,937	289,257	16,519
Road from Sámalkót to Cocanada	(1) Cocanada	594,047	37,143	2,963
Road No. 10.—Rajahmundry to Ellore	(1) Kovvur	97,636	78,740	9,979
	(2) Ellore	216,785	3,836	..
Road No. 11.—Tállapúdi to Ellore *via* Jangareddigudem.	(1) Jangareddigudem ..	101,214	9,858	1,586
Road No. 12.—Road from Masulipatam to the Hyderabad frontier *via* Jaggayapet.	(1) Masulipatam	700,024	37,381	..
	(2) Bezváda	508,536	125,141	3,863
	(3) Chillakallu	541,855	29,100	4,685
Road No. 25.—Road from Madanapalle to Chittoor *via* Punganúr and Palmanér.	(1) Punganúr	179,895	27,820	8,214
Road No. 34.—Salem to Atúr and on Vriddháchalam ..	(1) Atúr	424,717	242,955	19,722
Road No. 42.—Máyavaram to Tiruturaipúndi ..	(1) Perinjeri	191,211	225,454	1,420
	(2) Kallamangudi ..	249,907	176,636	544
	(3) Sannamallur ..	335,374	204,544	2,616
	(4) Tiruválúr	223,291	308,103	2,835
	(5) Sengandi	1,454,719	170,746	317
Road No. 48.—Palamcottah to Tenkási *via* Ambásamudram.	(1) Tenkási	656,208	308,136	3,362

(A true Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

To the Secretary to Government, Revenue Department.

Copy to all Collectors.

APPENDIX I.

From E. H. HAZELTON, Esq., V.S., A.V.D., Inspector of Cattle Diseases, Madras Presidency, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Kodavasal, 4th July 1890, No. 766.

I have the honor to submit, herewith, the Annual Report of this Department for the official year 1889-90.

The strength of the Department on 31st March was as under:—

Inspector	1
Deputy Inspector	1
Sub-Assistant Director of Agriculture	1
Stock Inspectors	18
Clerk	1
Compounder and Clerk	1
Peons	3
Total	26

The Deputy Inspector has continued in charge of the pony-breeding and castration operations in Coimbatore during the year. He investigated and treated an outbreak of rinderpest in the Coimbatore district, and also brought to light a case in which a number of cattle were poisoned in that district in January. They were undoubtedly cases of deaths from poisoning, 8 out of 15 cattle dying in one day and the contents of the viscera of one were sent to the Chemical Examiner, Madras, who found arsenic in them, the matter was brought before the Magistrate at Palladam, but was dismissed from want of proper evidence. No Stock Inspector has been available for duty in the Coimbatore district, but the Deputy Inspector has been available when wanted for cattle-disease prevention. He inspected the work of the Stock Inspector of Trichinopoly.

The Sub-Assistant Director of Agriculture has worked under me during the year; in the early part of the year he was working in Tinnevelly where rinderpest had been prevalent. He attended the Sivalaperi fair which is held a few miles from Tinnevelly; the fair is an important one and is held in connection with the Chitra car festival. The zemindar of Maniyáchi took an interest in the fair, and by sending cattle of his own and inducing others to do likewise, raised it to its present importance. A few cases of rinderpest were found there and dealt with. After Easter, the Sub-Assistant Director proceeded to inspect the work of the Stock Inspectors of Tinnevelly and Madura and reported on his inspection; he then went to Tanjore to assist and inspect the work of the Stock Inspector there; he remained in Tanjore for nearly four months and was busily engaged during that time in treating cases of disease, principally rinderpest which was rife in the district. He found that many cases of deaths from infectious disease had not been reported, and brought the conduct of the village officers concerned to notice, and they were punished.

Hospital pounds had been erected in Tanjore in many places, but owing to the scarcity of waste land, many of the sites were considered objectionable by the Sub-Assistant Director (also unless a trained agency is available for the charge of these pounds, they are not of much use, as the ryots do not care to send their sick animals out of their houses, and will not make use of the facilities afforded them of themselves). He notes that it was remarkable that only the disease anthrax was prevalent in the Nannilam and Negapatam taluks and afterwards in Patukóta. He submitted a full report on the work of the Stock Inspector of Tanjore, which will be referred to later on.

In September he proceeded to the Chingleput district where he remained until February 3rd, 1890, supervising the work of extra Stock Inspectors and working the Cattle Disease Prevention Act. The operations in this district will be referred to in another place.

He notes that, as a rule, rinderpest is very mild among cattle that are generally kept at pasture in jungles and grazing tracts, and he quotes instances in which the mortality among such cattle was only about five per cent of attacks, and in an instance of infection of the cattle of a village called Agili from a herd which had been infected, the disease proved to be very mild, and all the cattle recovered; this is a very peculiar circumstance, and I can only explain it by inferring that the disease rinderpest has worn itself out in the Chingleput district, for it has been prevalent there to my knowledge for nearly three years, and its virulence has become much less. I do not think this will apply to every portion of the district, but it may to some localities. My own experience being that herds at pasture or stall-fed animals are equally affected and the mortality in both cases is considerable. He notes that there is a common belief among ryots that if rinderpest appears in any village during a new-moon it will prove very serious, but not so if the moon is waning.

In Tinnevelly, Madura and Tanjore districts, gingelly-oil, milk and plantains are extensively used in the treatment of rinderpest. He met with a case in which a buffalo had suffered from rinderpest and recovered in 1888 and was again attacked and died in 1889, and he infers that one attack does not confer a prolonged immunity from the disease. He notes that in parts of Tanjore, lard is suspended in cattle-sheds as a preventive against rinderpest, but no facts are brought forward to prove its efficacy.

He attended the Bellary and Salem Agricultural Exhibitions and accompanied some Japanese gentlemen on a tour of agricultural inquiry in the Presidency. He proceeded on privilege leave on 25th February 1890.

The Sub-Assistant Director has been fully occupied during the year and has performed the work entrusted to him with great energy and thoroughness.

Stock Inspectors.

Stock Inspectors have been concentrated during the past year in badly infected areas from time to time. The work done by them when away from their own districts will be remarked on under the heading of "Special preventive measures."

I now give a districtwar *résumé* of work done during the year.

Ganjam.—No Stock Inspector was available for work in this district although cattle diseases were prevalent.

Vizagapatam.—No Stock Inspector worked in this district during the year. Cattle diseases were not generally prevalent.

Godávari.—A Stock Inspector was posted to this district in October last. This Inspector was admitted to the Department after a year's training as a probationer on November 4th, 1889. Rinderpest, anthrax and epizootic aphtha were prevalent in the taluks of Rámachandrapuram, Cocanada, Narasápur, Pithápuram and Peddápuram. He found that there is a large trade in raw hides from Cocanada which tends to spread infection. He states that he has done his best to explain to ryots and village officers the nature, cause, and prevention of contagious diseases, and he has left written instructions and prescriptions with the village officers of every village he has visited and he has read and explained the instructions issued by this office for the treatment of rinderpest. He states that the ryots will not take the trouble to disinfect their infected sheds and that they are opposed to the burial of carcases, because of the value of the hide. The same superstitious ideas as to the cause of rinderpest exist in the Godávari, and it is common for the ryots to attempt to avert the anger of their goddess by sacrifices of sheep, goats or buffaloes. Another custom is to hang the carcase of an animal that has died of rinderpest to a tree in a conspicuous part of a village. He notes that Sunn hemp (Janumu) is grown as a fodder crop, after the paddy is harvested, and stored for the hot weather.

The leaves of sugarcane are largely used as fodder in the Peddápuram taluk. He inspected the cattle markets at Drákshárámam, Pálakol and Pithápuram, to which places cattle from Vizianagrum and Nellore are brought for sale; good buffaloes are brought from Vizianagrum and are much valued by the ryots. He met with no cases of poisoning. He gave some instruction to a taluk peon who had some knowledge of cattle practice.

Previous to the posting of the present Stock Inspector, the Stock Inspector of Ganjam was working during April, May and part of June in this district when he visited the taluks of Cocanada, Pithápuram, Peddápuram, Rajahmundry, Rámachandrapuram and Tuni. He then was placed on the sick list, and on rejoining his duty, proceeded to Kistna.

Kistna.—Rinderpest was very severe in this district during the year, especially so in the taluks of Vinukonda, Palnád, Répalle and Bápatla. A Stock Inspector was working singlehanded there up to September when a number of Inspectors were concentrated in the district, and I proceeded there to supervise them. Further remarks on this subject will be found under the heading "Special Establishment and operations." After the work of the special establishment was concluded, viz., in December 1889, it was found necessary to leave three Stock Inspectors in the district; one was subsequently removed, and two men are now working there Disease has very much subsided.

Rinderpest was the most prevalent disease, but anthrax and foot and mouth disease were also met with.

Nellore.—A Stock Inspector was posted to this district on 6th July 1889, but he did not proceed to the district until December 1889, as he was on special duty in the Kistna district. He was admitted into the Department on 6th July after 13 months' training as a probationer. I shall remark on his work as a probationer in its place. He has been working in the district since January and has visited Rápúr, Gúdúr, Kávali and part of Kandukúr taluks.

Rinderpest has been prevalent in each of these taluks. The Stock Inspector has adopted a method of segregation as follows: "All the infected animals are kept within the premises, &c., of the village while the healthy animals are penned on the arable, waste, or pasture land outside the village; when any animal is suspected, it is at once separated and taken into the village." (This plan is frequently adopted by the ryots, and although I think that it is open to grave objections, yet it is better to get the above system carried than to allow the sick and healthy to

remain together unless a trained staff is available to work hospital pounds, the good effected by starting hospital pounds and leaving the ryots to work them is very inappreciable. A Stock Inspector with the whole district for his range must keep moving and so cannot do much work at any one pound).

The Stock Inspector has found much difficulty in inducing the pariahs and ryots to relinquish the hides of animals dead of a contagious disease, and he quotes an instance of a village in which the practice of skinning the carcases of animals dead of rinderpest was being carried on largely and openly and that his advice to bury all animals in the skin was received with so much opposition that he was obliged to leave the village. He notes that the registers of cattle mortality are maintained very irregularly and he is trying to improve this. He has met with no cases of poisoning.

Kurnool.—The Stock Inspector has visited 6 taluks of the district and has been on special duty in Kistna. Márkápur taluk has been badly infected with rinderpest. He notes that it is very difficult to segregate cattle as there are no cattle-sheds apart from the dwelling-house of the family of the owners and that although the advantages of the practice are known to many, yet, owing to this fact, they do not adopt it. (I think that there is a great deal of truth in this, but also that it would be an easy matter for ryots to segregate their sick cattle if they wanted to do so). He has many times observed that pariahs send the flesh of animals which have died of rinderpest to their friends and relatives in adjacent villages, and he thinks this spreads the disease.

There is a custom in this district of keeping the dung of cattle in pits dug to receive it; once a year the manure is removed and carted to the fields; the pit often becomes filled with water during the rains, which water is very considerably contaminated, and if rinderpest has prevailed in the village, the water in these pits must become a frequent source of contagion during the hot weather; he has often seen cattle drinking the water from these pits. He notes that the people in many of the villages refuse to have their cattle-sheds, which are a part of the ordinary living room, fumigated with sulphur. He has met with no cases of poisoning.

Bellary.—Cattle diseases were reported from all the taluks except Ráyadrug, Kúdligi and Bellary. From April to August, the Stock Inspector was working in the taluks of Adóni, Alúr and Hospet, and he visited most of the affected villages. He was transferred to the Kistna district on special duty at the end of August, while there, he underwent his examination for promotion which he successfully passed; he returned to his own district in December and assisted at the Agricultural Exhibition held at Bellary in December. He attended the cattle fairs held at Mylar and Kuruvatti and also the festival at Humpi. Cattle disease was not very prevalent in the district during the year; rinderpest, anthrax and epizootic aphtha were reported. He states that the village registers of cattle mortality are often found improperly kept, and he frequently has had to report village officers for not maintaining a register; the entries are made very irregularly; in many cases deaths of sheep and goats are seldom registered. No cases of cattle poisoning were met with during the year.

Anantapur.—Rinderpest was reported from all the taluks of the district, but Penukonda and Hindupur suffered most severely.

From July to October, the Stock Inspector was on the sick list. The Stock Inspector of Salem was doing duty in the district for 5 months; he worked in the three taluks of Penukonda, Hindupur and Madaksíra. The Stock Inspector states that he has not received a single report of disease among sheep or goats, and on asking why village officers do not report disease in these animals, they say that it is very difficult to ascertain the number of deaths and that those that die are consumed by their owners. He states that the Madigas (pariahs) carry diseased flesh for consumption to other villages. When there is rinderpest in a village, these men invite their friends and relations and distribute the flesh, hides and carcases which are taken to other villages where the refuse is thrown aside anywhere; sick animals are taken along the public roads and into villages. He has seen in the taluks of Hindupur, Penukonda and Dharmavaram ryots who have removed their healthy cattle to the fields and left their sick in the houses, but he states that they do not do this thoroughly and that often the same men look after the sick and the healthy. He states that the registers of cattle mortality are still imperfectly maintained, although he has been trying hard to get them properly maintained. He attributes these irregularities to the inadequate punishment awarded when the errors are pointed out, saying that, as a rule, a warning only is given and he is quite certain that half of the actual mortality is not reported.

He found no cases of cattle poisoning during the year.

Cuddapah.—The Stock Inspector joined the district on the expiry of his leave in April 1889, and remained there until September, when he was sent on special duty to the Kistna. He inspected almost all the infected villages of Cuddapah, Pulivendla, Kadiri and Madanapalle. He states that he has taken every care to instruct the ryots in the advantages of segregation, the necessity of pure water, nursing and the use of salt in food. Rinderpest was the principal disease met with; no cases of epizootic aphtha were seen. The taluk of Madanapalle was severely infected with rinderpest. The cattle in this taluk are not so valuable as those met with in the taluks

bordering upon Nellore. This Stock Inspector was sent to Nellore for duty after his duty in the Kistna was finished, and he worked in the Rápúr taluk where epizootic aphtha was very prevalent; he afterwards proceeded to the Kandukúr taluk where rinderpest and epizootic aphtha prevailed.

Chingleput.—Special reference is made to this district under the heading "Special operations;" the Stock Inspector was working in the district the whole year.* Rinderpest and anthrax were the prevailing diseases and every taluk was infected. Epizootic aphtha was severe towards the end of the year, but did not cause much loss; the district has suffered severely from rinderpest during the year.

* Except when he attended the Agricultural Exhibition at Salem.

North Arcot.—The Stock Inspector was working in the district from April to May when he proceeded on leave for one month and 19 days. In September he was sent to Chingleput on special duty, but remained there only a month when he was sent to attend the Subramania fair in November, and remained on duty in the district (South Canara) until the end of the year. Cattle disease was not very prevalent during the year.

South Arcot.—The Stock Inspector, South Arcot, has been working in Tindivanam, Cuddalore, Chidambaram, Kallakurchi, Tirukoilúr and Villupuram taluks during the year; the other taluks were not much troubled by cattle disease. Early in the year, Tindivanam was much infected. The Stock Inspector found great difficulty in carrying out the provisions of Act II of 1866 in the district and cites instances in which the village officers would do nothing for him. In the Chidambaram taluk he erected four hospital pounds, two at Government expense and two at the ryots' cost; in the former 13 animals were admitted, of which 5 died and the rest recovered; in the latter 19 were impounded, 14 died and 5 recovered. In addition, there were very many infected cattle not impounded, because of the unwillingness of their owners to take the trouble; he worked in this taluk (Chidambaram) from May to July when disease much abated. From July to October he worked in the Cuddalore and Chidambaram taluks when rinderpest and anthrax were severe, afterwards he proceeded to Tirukoilúr when rinderpest was very rife, and where the reports and registers of cattle disease were very irregularly kept; he was successful in improving the registration; a pound was built at an infected village. He stayed more than two months in this taluk having plenty of work. He proceeded to attend the Tiruvannámalai fair in November, returned to Tirukoilúr after a fortnight's absence. He went to Kallakurchi to inspect an infected village and arrange about the erection of a hospital pound which was not after all found necessary. After Christmas, foot and mouth disease spread over the district, and because of its mild character, it was never taken much notice of by village authorities.

He then proceeded to Salem for duty at the Agricultural Exhibition there. Having completed this duty he returned to Cuddalore taluk, from which he had received reports of rinderpest, and finding that the outbreak was subsiding, he proceeded to Tirukoilúr taluk where there was rinderpest; he continued in this taluk at the end of the year.

Owing to the failure of the monsoon, fodder for cattle is very scarce in the district, and they suffer very severely. He met with no cases of cattle poisoning during the year. He complains that there is no law to prevent the pariahs removing the hide from a case of rinderpest and disposing of the carcase as they please.

Salem.—The Stock Inspector worked in the district during the year with the exception of the months of August, September, October, November and December, during which he was sent on duty to Anantapur. Rinderpest was reported from all taluks except Tirupatúr; during the latter portion of the year epizootic aphtha prevailed. He notes that in several cases rinderpest was erroneously reported as variola. He states that the ryots gladly receive the medicines he offers and attend to his instructions and that they do segregate their animals but not perfectly; it is more practised in the Hosúr division of the district than elsewhere. He states that the village officers and cattle owners have given him no cause for complaint, and that they have carried out his instructions when they have been able to do so; but he further remarks that he often does not receive reports of disease from villages until very late, owing to many karnams living away from their villages and so remaining ignorant of an outbreak of disease until great damage is done. He notes the following circumstance: that he received a request from a Tahsildar for his services for an outbreak of rinderpest which outbreak was assisted by the pariahs who had a large interest in the Hide trade and who "washed the internal organs in the scanty supply of drinking-water to promote the spread of the contagion and thereby to benefit themselves. The suppression of this nefarious practice checked the outbreak." The pariahs were detected by the Stock Inspectors and the Deputy Tahsildar and were warned, but no further action could be taken as there is no legislation providing for this offence other than the Act II of 1866, which was not in force in the district.

Coimbatore.—No Stock Inspector was working in this district which has not suffered severely from cattle diseases.

Trichinopoly.—During the year the Stock Inspector has been working in the taluks of Musiri, Udayárpálaiyam, Kulitalai and Perambalúr.

Rinderpest was prevalent throughout the district, but especially severe in Musiri taluk where the Stock Inspector worked principally. Epizootic aphtha also was severe, but the mortality from this cause was slight. Anthrax was not serious. He inspected the cattle fairs held at Thurayur and Kamanur. He found great difficulty in inducing cattle-owners to carry out his instructions, and notes that they complain that they have not the means to supply their sick cattle with suitable nutriment. He has left written prescription with cattle-owners in addition to the ordinary treatment pursued by himself. He has met with no cases of poisoning.

Tanjore.—The Stock Inspector of this district was appointed on 27th March after having undergone 12 months' probation. The late Acting Stock Inspector of Tanjore was dismissed for various reasons, which are before the Board. He had proved himself utterly unprincipled and useless, having falsified his diaries to a great extent. The present Stock Inspector has only been working a short time.

Tanjore has been seriously infected during the past year, rinderpest and anthrax having prevailed very considerably. All the taluks have been infected.

Madura.—The Stock Inspector of this district was working there for six months—April to October—when he was transferred on special duty to Chingleput where he remained for the rest of the year. During the four months he was in Madurá he was on duty at the Madura fair in April; he then accompanied the Sub-Assistant Director of Agriculture on inspection to the Madura and Periyakulam taluks when rinderpest was prevalent; he continued his inspection after the departure of the Sub-Assistant Director. He notes that the fodder supply of cattle in this district is somewhat scanty; a variety of black cholum is grown exclusively as a fodder crop in some parts of the district. Instruction was given to the ryots on the treatment and prevention of communicable diseases, on the use of salt, disposal of carcases, &c., but the Stock Inspector regrets that these instructions were not well attended to, and suggests that they should be enforced during an outbreak of disease. He states that one reason why ryots will not segregate their cattle is prevalence of cattle theft in the district. The registration of cattle mortality is imperfect, and diseases are wrongly classified, rinderpest being often classified as diarrhœa and dysentery. He has met with no cases of cattle-poisoning.

Tinnevelly.—The Stock Inspector of this district was working here from April to September when he was transferred for special duty to Chingleput; he returned to his district at the beginning of March 1890. Rinderpest was not so prevalent in the district as during the previous year, but was nevertheless widely distributed during the early portion of the year. The Stock Inspector worked in the Ambásamudram, Tenkási, Tenkarai, Nángunéri and Otapidáram taluks, treating cases of rinderpest. He notes that he met with cases of sheep-pox in the Ambásamudram taluk, and states that the disease is well known to the ryots as a communicable one, and they make great efforts to prevent the contact of flocks, but when a flock becomes infected the disease is allowed to run its course in that flock, no attempt being made to arrest its progress. He also notes that very little care is taken by the ryots to confine and segregate cases of rinderpest. He remarks that "even persuading people to place the infected animals at a small distance from the villages in a tope or similar locality was not successful. I had to separate the infected animals as far away from the healthy as the places in the possession of the owners of the sick animal, permitted, &c. &c."

The Sub-Assistant Director of Agriculture inspected the work of this Stock Inspector in May and sent in a favorable report. The Stock Inspector noted many irregularities in keeping the village cattle mortality registers and brought them to notice. He left the district for Chingleput in September (his work in Chingleput will be noticed hereafter). He returned to Tinnevelly on 6th March 1890, and proceeded to the Sankaranainárkoil taluk for duty where there was a large outbreak of epizootic aphtha. On 23rd March he proceeded on three months' privilege leave.

Malabar.—Rinderpest and epizootic aphtha prevailed during the year, the former chiefly in the Wynaad and Chirakal taluks, the latter in Calicut, Chirakal, Kóttayam and Ernád. The Stock Inspector attributes the spread of rinderpest, which he states originated in South-east Wynaad, to infection by cart bullocks travelling through the Chirakal taluk. He also states that he received reports only when the disease had established itself thoroughly. He has frequently inspected the slaughter-houses at Calicut, Cannanore, Tellicherry and Badagara. He mentions that the carcases of cattle which die from contagious disease are appropriated by the Pariahs, and the remains are scattered over grazing lands, although instructions are everywhere given that they should be otherwise disposed of. (This matter is receiving attention).

South Canara.—The Stock Inspector of this district was on special duty in the Kistna district from September 1889 till February 1890. The Subramania fair at which the Cattle Disease Prevention Act is introduced was supervised by another Stock Inspector. The fair is held in November.

Rinderpest, anthrax, variola, epizootic aphtha and diarrhœa and dysentery were the diseases met with during the year. The mortality from rinderpest and anthrax was much less than during the previous year. The Stock Inspector alludes to the facilities for segregating

infected cattle in the district, but states that the ryots are too wedded to the customs of their forefathers to do as they are advised. He believes that the manner of disposal of carcases in the village is the chief cause for the spread of the disease. Strict instructions on this subject were issued to village officers both by the District Magistrate and himself, but the Pariahs still obtain the carcases, remove the skin, and cut up the flesh and leave what they don't want on the waste lands, &c. The hide they sell to the hide merchants. The Stock Inspector thinks that "it should be ruled that ryots neglecting to bury diseased carcases properly are liable to punishment and the trade in hides should be legally controlled."

(The trade in hides certainly is a frequent carrier of disease which would not be so much the case were they dried hard before being carted through the country, or still better partially tanned; it is the "green" hide that causes the mischief. Also some legislation is required with regard to the disposal of diseased carcases; at present unless the Cattle Disease Prevention Act is put in force in a district, the ryots cannot be compelled to bury their cattle dead of rinderpest, and unless hospital pounds and keepers are appointed under the Act, nothing can be done; one staff is not large enough to carry out the provisions of the Act, which must be done by a trained agency or it could not be operative).

The work of the South Canara Inspector in the Kistna will be noticed hereafter. He thinks that the subject of cattle diseases and their treatment, sanitation, stock-breeding, &c., should be introduced into primary schools and should be made an optional subject for the primary school examination and compulsory for the candidates for the posts of village magistrates.

Tables of work done by Stock Inspectors during the year are here subjoined.

Remarks on Stock Inspectors.

During the year the Acting Stock Inspector of Tanjore was dismissed for reasons already given. Three probationers were admitted into the department and posted to the districts, five Stock Inspectors were promoted to the grade carrying pay at the rate of Rs. 75 per mensem.

The conduct of most of the Stock Inspectors has been good, but Stock Inspector Venkataramana Sastry has been guilty of insubordination and has been punished. Stock Inspector Canthiah Mudaliar was also found fault with as his work was not good and he has been warned and transferred to another district. Stock Inspector G. Rangiah Naidu has not given satisfaction; his case is under consideration. Stock Inspector C. Visvanatha Iyer has not worked as well as he should have done, being inclined to be lazy; his work is being closely watched.

The other Stock Inspectors have given satisfaction, notably Stock Inspectors B. K. Santaya, Subramania Mudaliar and M. Kuppoosawmy Sastri. Although there has not been such a loss from cattle diseases during the year 1889-90 as took place in 1888-89, yet the Stock Inspectors have been fully occupied; their attention has been more directed to villages from which reports of disease have been received, and as a consequence they have not visited so many non-infected villages; owing to the size of the charge of a Stock Inspector he is often obliged to visit villages from which he has received no reports, and this cannot be always avoided.

Every Stock Inspector complains of the want of a permanent peon to accompany him. At present Stock Inspectors are provided with peons from the taluk in which they may be working; frequently when they want a peon they cannot get one as they are on various duties. During jamabandi it is very difficult to obtain one; moreover, they are given the most useless man as a rule; without a peon very few village officers will pay much attention to the wants of a Stock Inspector, and he has to do everything for himself which naturally detracts from his usefulness as a Stock Inspector. I think they should all be provided with a peon who should remain with them while in the district; this man could be trained and would prove of great assistance to them in their work.

Stock Inspectors are always directed to endeavour to bring about the greatest accuracy in reporting cattle mortality by village officers, and they are constantly bringing to light irregularities in this direction and do their best to rectify mistakes. During the year, in consequence, I believe, of the many instances of error, the form was simplified, and all that is demanded now is that a correct statement of deaths shall be submitted, all information concerning attacks and recoveries being omitted. The system has not been in vogue sufficiently long to enable me to express an opinion upon it, but I think the idea is correct as it will be much more simple to remember and note down only the death than to remember the number of attacks, recoveries, deaths and those remaining sick. Stock Inspectors can readily collect this information on making inquiries.

Of the five probationers who were under training, three have been admitted to the department and two were dismissed as they failed to pass their examinations.

Special operations.—During the year special repressive operations were carried out in two districts in which contagious diseases were very rife, viz., in Chingleput and Kistna districts. In the former the Sub-Assistant Director and 4 Stock Inspectors worked; in the latter, I supervised the work of 6 Stock Inspectors (5 at first). As regards the work done in Chingleput, Act II (1866), the Cattle Disease Prevention Act, was notified and placed in operation, when at first the

operations were confined to the taluk of Madurántakam and later other taluks were included. Unfortunately for the success of the operations, rinderpest, the prevailing disease, assumed a sporadic form as soon as the extra staff began work, and it was seldom that an outbreak could be met with; no sooner did a few cases occur and a hospital pound became apparently necessary, than the disease would die out for a week or a fortnight; this did not give much work for the pounds, and as a matter of fact only two pounds were erected and these were insufficiently used. Notwithstanding the peculiar behaviour of the disease, a large number of cattle were treated but not as was intended in hospital pounds.

I append an extract from a report of the Sub-Assistant Director on this subject—

"From 26th September 1889 till 3rd February 1890, I worked in the Chingleput district.

On making careful inquiries in the villages of Madurántakam, Mambakkam, Karungali, Thottanaval, Madhur, Alapakkam, Atheyurmelthuli, Olugarai, &c., where the disease appeared to be rife, we found that rinderpest had almost subsided, so that I reported to the Collector as well as to the Inspector of Cattle Diseases that there was no work in Madurántakam taluk for any of us. The Collector ordered me to wait for a week more before coming to the conclusion that rinderpest had subsided in the taluk.

Disease indeed reappeared in Mambakkam and appeared to be on the increase. I lost no time in applying for sanction for an hospital pound. I believed that there would be no necessity for accommodating more than 4 sick animals at any time. The pound was erected at a cost of Rs. 7 and was ready on 22nd October. The pound was erected within two days after sanction was received from the Collector; no sooner was the pound ready than the disease appeared to have almost subsided * * * Subsequent to the erection of the pound, till I left the district, 12 cases occurred, a few cases occurring at long intervals; of these, only 3 could be impounded." (An explanation has been submitted on this point from which it appears that the disease was mild, that the ryots were somewhat obstructive and so animals were left out of the pound).

A case of rinderpest from another village was also impounded at the Mambakkam pound—

"In Madhur disease had very much abated when the pound was ready for use."

"In November, 14 animals were impounded and in December 1 animal from the adjacent village of Malanathur Madhur was impounded. Of the 15 animals impounded, 5 died and the rest recovered.

*

About the middle of November, the Stock Inspector of Tinnevelly found that the carcase of a bullock belonging to one Yellappa Pillai of Madhur which had died at the hospital pound had been disinterred and taken away by certain Pariahs who before the death of the animal had attempted in vain to strike a bargain with the owner for the hide * * * The Pariahs admitted before the Tahsildar-Magistrate that they disinterred the carcase, but since the police had charged them under section 379 of the Indian Penal Code with having committed theft, the magistrate discharged them on the ground that the disinterment of an infected carcase did not directly cause any wrongful loss to any person and that the buried carcase was not a property in anybody's possession * * * *

I wrote to the Tahsildar before the case was inquired into pointing out that a poundkeeper is a public servant whose duty it is, under the Cattle Disease Prevention Act, to bury the carcases of the animals dying at the pound, and that whoever voluntarily disinters a carcase buried under his orders simply undoes his work, and that if as often as a poundkeeper gets an infected carcase buried in compliance with the requirements of law, some Pariahs disinter it, the public servant is, in effect, obstructed in discharging his lawful duty, and that therefore the Pariahs were chargeable under section 186 of the Indian Penal Code. The Tahsildar was not of that opinion and dismissed the case.

*

It has been decided, I believe, that no prosecution can be conducted against any body on account of the traffic in infected hides, which is indeed a serious nuisance, tending to spread infection broadcast in the country."

"Two ryots of Melanathur Madhur, named Manna Reddi and Subba Reddi, were prosecuted for resisting the impoundment of their sick animals. Subba Reddi was convicted and fined 8 annas by the Sheristadar-Magistrate and the other was discharged for want of evidence."

"Complaints were preferred against 6 more ryots of Melanathur Madhur for not giving notice about their 13 animals being attacked with rinderpest. On account of the jamabandi, the Tahsildar deferred inquiring into the cases until the special prevention establishment was dissolved, and I hear that the cases were all discharged." (This delay on the part of the Tahsildar in disposing of these cases is being inquired into by the Collector, but I have not heard of the result—E.H.H.")

In the Kistna district the operations were confined at first to the Vinukonda taluk and on the subsidence of disease there the taluks of Palnád and Bápatla were attended to. I have already reported fully on the subject of these operations, but I give here an extract from one of my reports to show the state of affairs there :—

"In Vinukonda taluk, rinderpest first appeared to any extent this year at the end of July and the beginning of August last, when large numbers of cattle were attacked. The cattle, with but few exceptions, had just arrived in the taluk from surrounding taluks, notably Bápatla, which annually sends very large numbers of cattle for grazing to the forests of Vinukonda. It is reasonable to infer that the disease was introduced by these "foreign" cattle for the following reasons, viz. :—

(1) Rinderpest was prevalent in Bápatla taluk during May and June last.

(2) There was very little disease (rinderpest) in the Vinukonda taluk until after the arrival of many of the herds in July and early in August.

(3) Many villages on the road leading into this taluk (there is only one main road) have been infected with rinderpest.

(4) Rinderpest appeared in several villages about the same time as the herds arrived in their neighbourhood; this I have found to be a fact at the villages of Ramidicherla, Garikipad, Ayanampalliam, Rauvulapuram, Bollapally and Yeepur.

(5) In the case of the herd of buffaloes mentioned in my last report at Garikipad, these arrived from a village in Bápatla where rinderpest had caused a large mortality, and a very large number of these animals died at Garikipad from the after-effects of the disease.

2. "Rinderpest having been introduced, the causes for its spread were several. Firstly, the herds are brought by the owners or persons interested in them to the neighbourhoods of the grazing areas and are there left in the charge of "watchers" or care-takers, who drive them to and from the pastures and who are men belonging to the local villages. These men have no interest themselves in the welfare of the animals other than the prospective receipt of some small sum (4 annas in many cases) for each head handed over to the owners who return to receive the cattle in February or March of the ensuing year. Moreover so many cattle are placed in charge of a few men that it is practically impossible that they can look after them properly when disease breaks out; as a matter of fact they do not. Forcible instances of this have come under my observation. On one occasion, I had some twenty buffaloes under treatment and had to get them from among the rest of the herd in order to treat them. To effect this, I had to get the assistance of the men in charge. I managed very well for a few days, but when the novelty wore off, I could only get one or two men to help, and as these were not in charge of the portions of the herd to which several of the sick belonged, I could not get the animals at all. The men afterwards came to take the herd to graze, and they were asked to get the sick out for us, and they refused, saying that they did not care whether they died or not, and that they were not going to take the trouble to help. One man was prevented for a time from taking his portion of the herd to graze, when he left the place, saying he did not mind and that they could stop there all day for all he cared.

"It was impossible to force these men to do as they were requested, for the village officers had no power over them, and as the cases were not of a contagious nature (see report, dated 1st November 1889, No. 1113, paragraph 6), they could not be proceeded against under Act II of 1866.

"Again, when disease breaks out, the men in charge do not trouble to separate the sick from the healthy, but all are jumbled together in the pens by night and graze together during the day, those animals too ill to accompany the herd being left to take care of themselves.

"Carcases are left to be eaten in the nearest nullah when they die near the pound; if in the forest, they are left where they die. The Madigas of the nearest village take the hides when they can, and carcases are never buried. There is no one to bury them, for they do not die in a village but on the outskirts, often a mile or so away. The roads used by the cattle are thickly strewn with carcases during an outbreak, and so the whole area becomes contaminated. The jungles used by the different herds adjoin and disease is transmitted in every direction (Rauvulapuram and Garikipad are supposed to have become infected in this manner in the first instance from Ramidicherla).

3. "The disease commencing in August ran its course very rapidly, the greatest mortality occurring in September and early in October. During October very heavy rain fell over the whole taluk, and during a week or ten days in that month the death-rate was very heavy; this was caused by the exposure to rain and cold of the already debilitated animals. Now (November 14th) I think that the disease will gradually subside. The condition of the herds has now much improved; those parts which were almost unbearable owing to the carcases rotting all round are

now clean and healthy; hundreds of carcases were washed away by the freshes in the water-courses rushing down from the neighbouring hills; the pens have been washed clean and so have the animals themselves, and most of the sick animals have either recovered or died, and at the present moment there are only four centres in which rinderpest exists in the taluk, and at each of these a Stock Inspector is working.

"Since we have been working in the taluk, that is from 26th September last to date, pounds have been erected at the villages of Vinukonda, Rauvulapuram, Bokamantalapad, Ayanampalliam, Agnigundala, Angalur and Valepur, while at Ramidicherla, Ballapally, Malepadu, Garikipad and Yeepur we have been working. At all these places carcases have been buried, in some places burnt, and cattle treated. Ryots and others have been told and shown the benefits to be derived from segregation of the sick and the proper disposal of carcases, but the reasons I have stated above in paragraph 2 preclude much hope that any advice will bring forth fruit.

"The ryots generally look upon us with dislike, they do not desire our help, they are caused a certain amount of trouble by the erection of a pound and the impounding of their cattle, and they don't like the trouble and don't think the removal of sick from the healthy any use. At Agnigundala great resistance was made to the sick cattle being removed to the pound and some cases have been brought to the notice of the Magistrate. Village officers dislike the trouble we cause them. At Ballapally this was carried to such an extent that a pound was not erected until after the outbreak had subsided and consequently it has been of no use."

Disease had greatly subsided by December, and only three of the Stock Inspectors remained in the district afterwards, one working in the Palnád and two in Bápatla taluk. The hospital pounds were continued in operation in the latter taluk and were well looked after by the Inspectors, and eventually the extra Stock Inspector was withdrawn from Bápatla and two men left in the district where they are now working.

I attach a talukwar statement of cases treated in hospital pounds. I cannot speak too highly of the good work shown by the Stock Inspector of South Canara, B. K. Santaya, upon whom burden of the work fell, he having been in charge of the pounds at Agnigundala, Vinukonda taluk, where he was assisted by probationer Moses Abraham, and Santravur in Bápatla; both of these inspectors suffered very severely from fever contracted at Agnigundla which was very malarious, and the probationer had to be sent on sick leave for two months in consequence.

RETURN showing the number of sick animals admitted into the hospital pounds under Act II of 1866 in Vinukonda, Palnád and Bápatla taluks, Kistna district, from 6th October 1889 to 22nd March 1890.

Name of pound.	Number of Animals			
	Admitted.	Died.	Cured discharged.	Remaining.
Agnigundala, Vinukonda taluk	165	62	96	7
Rauvulapuram do.	11	2	9	..
Vinukonda do.	14	6	8	..
Ayanampalliam do.	22	7	15	..
Angalur do.	2	1	1	..
Ballapally do.	..	..	..	..
Bokamantalapad do.	..	..	..	..
Valepur do.	17	2	15	..
Mandadi, Palnád	9	3	6	..
Adegoppalla Palnád	..	..	..	..
Vellapalliam Bápatla	10	5	5	..
Karamchedu do.	21	11	10	..
Santravur do.	40	29	11	..
Total ..	311	128	176	7

Medicines.—A statement is here given of the medicines despatched from this office for use in the districts during the year. I have always held that a universal medicine for a certain disease is not of much benefit as individual cases of the same disease require individual treatment, but the state of cattle disease in this Presidency makes it absolutely necessary that some such medicine should be provided for wide distribution and use, and I have been careful to see that as little damage as possible can accrue from the unintelligent administration of the drugs prescribed. I have again to add that the medicines supplied have been appreciated in many parts of the Presidency.

Dry cinchona febrifuge has received a short trial and, as suitable cases are met with, it will again be prescribed. I have recently submitted a report on this subject. Disinfectants were of considerable use in the hospital pounds in the Kistna.

STATEMENT showing the number of doses of medicines despatched to the undermentioned districts during the official year 1889-90.

District.	Astringent powder for rinderpest, 2nd stage.	Carbolic balls for anthrax and rinderpest, 1st stage.	For foot and mouth disease, external application.	For foot and mouth disease to make gargle.	Cinchona febrifuge.	Disinfectants.	
	DOSES.	DOSES.	LBS.	LBS.	LBS. OZ.	CWTS.	LBS.
Anantapur	..	..	..	..	..	..	..
Arcot, North	1,200	600	..	..	..	1	..
Arcot, South	900	750	..	..	0 8	2	..
Bellary	2,000	2,000	100	56	0 8	4	..
Canara, South	..	..	..	..	..	..	..
Chingleput	1,000	1,000	..	..	0 8	1	..
Coimbatore	1,000	1,000	100	56	1 0	..	..
Cuddapah	2,000	2,000	..	..	..	1	..
Ganjam	..	..	..	..	..	..	..
Godávari	1,000	1,000	..	..	0 8	1	..
Kistna	7,000	5,000	..	..	0 8	4	..
Kurnool	1,000	1,030	..	..	..	1	..
Madras	..	..	..	5	..	..	..
Madura	1,500	2,000	..	2	..	..	2
Malabar	2,000	2,000	..	..	..	..	..
Nellore	600	..	..	..	2 0	..	..
Nilgiris	..	..	..	30	..	..	60
Salem	..	1,000	..	..	..	2	..
Tanjore	3,000	3,000	..	..	..	..	..
Tinnevelly	..	500	..	..	..	..	..
Trichinopoly	..	..	..	..	..	..	..
Vizagapatam	..	..	..	..	..	..	..
Total ..	24,200	22,880	200	149	5 8	17	62

AGRICULTURAL EXHIBITION.

The exhibitions at Bellary in December 1889 and Salem in February 1890 were attended by a staff of Stock Inspectors, the Sub-Assistant Director and myself. Reports on these have been submitted to the Board and no further remarks are needed here.

OUT-BREAK OF EPIZOOTIC APHTHA AT THE MONEGAR CHOULTRY, MADRAS.

During December an outbreak of epizootic aphtha occurred at the Monegar Choultry, Madras, which was treated by the Sub-Assistant Director and a Stock Inspector. One hundred and eight cases were segregated and treated, and the out-break subsided in a few days.

MOVEMENTS OF INSPECTOR OF CATTLE DISEASES.

My movements during the year were as follows:—

During April I stayed at head-quarters; I was unable to travel owing to continued attacks of fever contracted during my tour in Madura during March.

On 11th May I left for the Coimbatore district in order to attend the Avanáshi fair; from there I proceeded to the Tinnevelly district to attend the Kannicheri fair, and returned to Madras towards the end of the month. During June I went to Cuddalore and Trichinopoly to examine Stock Inspectors for promotion, and also examined the Stock Inspector of Anantapur at Tadpatri. I then proceeded to Tirupur and Kángyam (Coimbatore) to inspect the fair and herd of the Palaycota Pattagar and returned to Madras on 19th June.

On 9th July I proceeded on a tour of inspection in the Anantapur and Cuddapah districts which lasted until 31st August.

On 11th September I started for the Kistna district, and remained there on duty until 7th December when I left for Bellary to attend the agricultural exhibition there.

I remained at head-quarters during January and left on 4th February for Mylar, Bellary district, to attend the cattle fair held there. I returned to Madras on 10th February and left on 15th for Salem to attend the agricultural exhibition there. After that I proceeded on tour through the district, and visited the breeding tracts on the banks of the Cauvery and marched through the district to Hosúr whence I returned to Madras on 11th March 1890.

REMARKS.

During my inspections I have taken every opportunity of lecturing to the ryots on the nature, causes, treatment and prevention of contagious diseases among cattle, and I have also instructed Stock Inspectors in the above to enable them to explain the matter to the ryots and put it to them in the simplest form.

I have personally treated many cases of rinderpest, but I have only once come across a case of anthrax, and I have not seen any cases of variola in cattle or sheep. Epizootic aphtha I have met with, but not to any extent. At the village of Pendurty in Anantapur, where rinderpest was prevalent at the time of my visit, I remained a week and established a hospital pound with the assistance of the reddi, who is a very intelligent man. I think the ryots there will adopt the same system should another out-break occur, as we were successful in stopping the disease.

I published a small pamphlet on rinderpest during the year and drew up some instructions to be published in District Gazettes on the same subject.

Conjointly with the Assistant Director of Agriculture I wrote a report on the supply of cattle in the Madras Presidency.

The service registers of the subordinates of the department have been maintained and verified up to date.

Cattle Disease Prevention Department.

STATEMENT showing actual receipts and charges incurred during the official year 1889-90.

Items.	Sanctioned estimate.	Up to last month.	In this month.	Total.	Amount available on the 1st April 1890.	——
RECEIPTS.—*Nil.*	RS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
EXPENDITURE.						
Salaries.						
Inspector of Cattle Diseases.	6,600	6,050 0 0	550 0 0	6,600 0 0	..	..
Deputy Inspector of Cattle Diseases.	3,600	3,300 0 0	300 0 0	3,600 0 0	..	..
Sub-Assistant Director of Agriculture.	2,470	2,260 0 0	210 0 0	2,470 0 0	..	..
Stock Inspectors	15,000	11,425 10 10	1,239 0 6	12,664 11 4	1,889 5 4	..
Probationers		445 15 4	..	445 15 4		
Total, Salaries ..	27,670	23,481 10 2	2,299 0 6	25,780 10 8	1,889 5 4	..
Establishment.						
Clerk	420	385 0 0	35 0 0	420 0 0	..	..
Compounder	300	275 0 0	25 0 0	300 0 0	..	..
Peons	240	219 3 7	20 0 0	239 3 7	0 12 5	..
Total, Establishment ..	960	879 3 7	80 0 0	959 3 7	0 12 5	..
Allowances.						
House-rent of Inspector of Cattle Diseases.	600	550 0 0	50 0 0	600 0 0	..	..
Travelling allowance of Inspector of Cattle Diseases.	2,200	2,379 12 7	323 0 10	2,702 13 5	..	502 13 5
Travelling allowance of Deputy Inspector of Cattle Diseases.	1,100	1,078 13 0	157 8 0	1,236 5 0	..	136 5 0
Travelling allowance of Sub-Assistant Director of Agriculture.	1,000	778 9 6	49 14 0	828 7 6	171 8 6	..
Travelling allowance of office establishment.	350	343 6 1	68 15 8	412 5 9	..	62 5 9
Travelling allowance of Stock Inspectors.	5,000	3,696 7 6	619 10 0	4,316 1 6	306 2 10	..
Travelling allowance of Probationers.		377 11 8	..	377 11 8		
Total, Allowances ..	10,250	9,204 12 4	1,269 0 6	10,473 12 10	..	223 12 10
Supplies and Service.						
Cost and distribution of medicines.	1,500	805 8 9	513 9 8	1,319 2 5	180 13 7	..
Total, Supplies and Service ..	1,500	805 8 9	513 9 8	1,319 2 5	180 13 7	..

Statement showing actual receipts and charges incurred during the official year 1889-90—*cont.*

Items.	Sanctioned estimate.	Up to last month.	In this month.	Total.	Amount available on the 1st April 1890.	——
Contingencies.	RS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
*Purchase and repairs of tents	1,300	668 2 5	..	668 2 5	631 13 7	..
Office—						
Postage	170	162 0 0	10 0 0	172 0 0	..	2 0 0
Telegram	40	15 3 0	0 8 0	15 11 0	24 5 0	..
I (*b*) Contingencies ..	420	503 1 2	78 10 11	581 12 1	..	161 12 1
Deputy Inspector of Cattle Diseases—						
Postage	40	20 0 0	..	20 0 0	20 0 0	..
Telegram		..	..	..		
Contingencies		..	..	..		
Stock Inspectors	650	419 11 2	80 7 5	500 2 7	149 13 5	..
Total, Contingencies ..	2,620	1,788 1 9	169 10 4	1,957 12 1	662 3 11	..
Total, Prevention of Cattle Diseases.	43,000	36,159 4 7	4,331 5 0	40,490 9 7	2,509 6 5	..

* This amount was sanctioned for the purchase and repairs of tents for the Inspector of Cattle Diseases and Assistant Director of Agriculture.

APPENDIX II.

TABLE showing the sick and lame Animals treated by Stock Inspectors during the official year 1889-90.

Number.	Names.	Number of villages inspected.		Number of sick animals.				Remarks.
		Infected.	Non-infected.	Admitted for treatment.	Recovered.	Died.	Unknown.	
1	P. Raghava Pillai	86	122	838	..	24	814	On sick leave .. .. YRS. 0 M. 0 D. 8
2	K. Padmanabhaya	116	96	423	291	89	43	,, privilege leave .. 0 1 19
3	M. Venkatramana Sastri ..	139	83	292	257	35	..	
4	A. Canthiah Mudaliar ..	136	94	506	157	108	241	
5	B. K. Santaya	131	92	457	316	110	31	On sick leave 0 0 15
6	M. Kuppusawmi Sastri ..	93	130	225	145	79	1	,, privilege leave .. 0 0 15
7	K. Sethu Row	189	178	397	277	117	3	
8	C. Viswanatha Iyer ..	85	95	152	118	34	..	On privilege leave .. 0 2 12 ,, sick leave 0 0 28
9	V. P. Subramani Mudaliar...	96	179	384	210	48	126	On privilege leave .. 0 0 24
10	K. Ramen	125	81	1,137	295	14	828	Do. do. 0 1 20
11	R. Narrayana Row	232	38	901	230	193	478	
12	V. Sithamber Devoo ..	81	63	178	113	45	20	On sick leave 0 5 4
13	G. Rungiah Naidu	143	70	387	166	84	137	
14	M. Hossen Ally Saib ..	94	167	364	292	29	43	
15	B. Subramaney Iyer ..	50	51	277	220	56	1	On privilege leave .. 0 0 10
16	S. A. Strinivassa Raghaven	129	170	289	228	61	..	Suspended 11th September 1889; since dismissed.
17	V. Chockalingam Pillai ..	41	10	352	11	11	330	Promoted to the grade of Stock Inspector from 6th July 1889.
18	R. Kamiah Naidu	88	52	495	50	11	434	Promoted to the grade of Stock Inspector from 14th October 1889.
19	Moses Abraham	..	..	..	..	..	..	Promoted to the grade of Stock Inspector from 27th March 1890.
	Total ..	2,054	1,771	8,054	3,376	1,148	3,530	

APPENDIX III.

STATEMENT showing the number of Villages inspected by the Stock Inspectors in each Taluk of the District in which they were posted for duty during the official year 1889-90.

1		2		3		4		5		6	
V. Sithamber Devoo.		R. Kanniah Naidu.		M. Kuppusawmi Sastri.		V. Chockalingam Pillai.		P. Raghava Pillai.		C. Viswanatha Iyer.	
Godávari and Kistna.		Anantapur, Cuddapah and Godávari.		Kistna.		Kistna and Nellore.		Cuddapah, Kistna and Nellore.		Anantapur.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
Godávari District.		*Anantapur District.*				*Kistna District.*		*Cuddapah District.*			
Tuni	12	Tadpatri	1	Palnád	30	Vinukonda	7	Pulivendla ..	28	Anantapur ..	25
Cocanada	12	Anantapur	1	Vinukonda	33	Palnád	2	Cuddapah ..	38	Gooty	43
Pithápuram	12	Penukonda	37	Bápatla	47			Kadiri	15	Tadpatri ..	49
Peddápuram ..	15	Hindupur	11	Répalle	38	*Nellore District.*		Madanapalle ..	23	Dharmavaram ..	17
Rajahmundry ..	18			Sattenapalle ..	14			Ráyachóti	26	Penukonda ..	24
Rámachandrapuram.	14	*Cuddapah District.*		Guntúr	13	Rápúr	14			Hindupur ..	18
				Narsaraopet ..	13	Gúdúr	14	*Kistna District.*		Madakasíra ..	4
Kistna District.	61	Kadiri	1	Bezváda	12	Nellore	4				
				Bandar	12	Kávali	6	Vinukonda ..	9		
Palnád		*Godávari District.*		Núzvíd ..	11	Kandukúr	4	Palnád	19		
		Cocanada	40					*Nellore District.*			
		Rámachandrapuram.	23								
		Rajahmundry ..	3					Rápúr	21		
		Narsápur ..	6					Kandukúr	29		
		Amalápuram ..	1								
		Pithapur	8								
		Peddápuram ..	8								
Total ..	144		140		223		51		208		180

Statement showing the number of Villages inspected by the Stock Inspectors in each Taluk of the District in which they were posted for duty during the official year 1889-90—*cont.*

7		8		9		10		11		12	
B. Subramaney Iyer.		G. Rungiah Naidu.		A. Kanthiah Mudaliar.		K. Padmanabhaya.		K. Sethu Row.		S. A. Strinivassa Raghaven.	
Bellary and Kistna.		Kurnool and Kistna.		Chingleput.		North Arcot, Chingleput and South Canara.		South Arcot.		Tanjore.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
Bellary District.		*Kurnool District.*				*North Arcot District.*					
Adóni	27	Márkápur	95	Chingleput	55	Wálajápet	16	Cuddalore	125	Kumbakónam ..	147
Alúr	12	Cumbum	62	Madurántakam ..	113	Gudiyátam	20	Chidambaram ..	88	Mannárgudi ..	3
Bellary	12	Nandyál	9	Conjeeveram ..	25	Arcot	10	Kallakurchi ..	44	Tanjore	14
Hadagally	7	Rámallakót	16	Tiruvallúr	13	Chittoor	9	Tirukoilúr	30	Negapatam ..	32
Harpanahalli ..	13	Pattikonda	16	Ponnéri	10	Palmanér	8	Tiruvannámalai ..	32	Máyavaram ..	56
Hospet	10			Saidápet	14	Arni	13	Tindivanam ..	25	Nannilam ..	21
Kúdligi	..	*Kistna District.*				Puttur	10	Villupuram ..	23	Pattukóta ..	26
Kistna District.		Vinukonda	15			Punganúr	3				
Bezváda	2					Kálahasti	14				
Guntúr	1					Mauderpauk ..	9				
Masulipátam ..	1					*Chingleput District.*					
Narsaraopet	1					Madurántakam ..	23				
Vinukonda	15					*South Canara District.*					
						Mangalóre	40				
						Udipi	35				
						Uppinangadi ..	2				
Total ..	101		213		230		212		367		299

Statement showing the number of Villages inspected by the Stock Inspectors in each Taluk of the District in which they were posted for duty during the official year 1889-90—*cont.*

13		14		15		16		17		18	
R. Narrayana Row.		M. Venkatramana Sastri.		V. P. Subramani Mudaliar.		M. Hossen Ally Saib.		B. K. Santaya.		K. Ramen.	
Trichinopoly.		Madura and Chingleput.		Tinnevelly and Chingleput.		Salem, Anantapur and Madras.		South Canara and Kistna.		Malabar.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
		Madura District.		*Tinnevelly District.*		*Salem District.*		*South Canara District.*			
Musiri	115	Madura	62	Tenkarai	14	Salem	11	Mangalore	52	Chirakal	71
Trichinopoly ..	20	Tirumangalam ..	3	Ambásamudram ..	38	Atúr	12	Kásaragód	27	Kóttayam ..	40
Perambalúr	96	Periyakulam ..	7	Nángunéri	19	Hosúr	62	Uppinangadi ..	39	Calicut	47
Kulitalai	26	Dindigul	14	Otapidáram ..	23	Dharmapuri ..	24	Udipi	31	Kurumbranád ..	48
Udayárpálaiyam ..	13	Sivaganga	9	Tenkási	23	Krishnágiri ..	13	Coondapoor	29		
		Mutukulatúr ..	5	Sátúr	21	Tirupatúr	6				
		Melúr	7	Sankaranainárkoil.	21	Uttankarai	24	*Kistna District.*			
		Tirupatúr ..	1								
		Tirushuli	12	*Chingleput District.*		*Anantapur District.*		Vinukonda	19		
								Bápatla	36		
		Chingleput District.		Madurántakam ..	73	Penukonda	48				
				Chingleput	43	Hindupur	60				
		Madurántakam ..	55								
		Chingleput	47			*Madras.*					
						Monegar Choultry ..	1				
Total ..	270		222		275		261		223		206

APPENDIX IV.

REMARKS on the statistics of mortality among the Live Stock in the Madras Presidency during the official year 1889-90, submitted by the Inspector of Cattle Diseases.

CATTLE.

During the year 1889-90 *Rinderpest* has again created a great deal of havoc among the cattle of this Presidency, but happily it has not been so severe as it was during 1888-89, less than half the number of deaths having been reported for the year under review; in all 38,252 deaths from this cause have been reported from the Presidency during the year. April and October 1889 were the months in which the greatest number of deaths occurred, and from November 1889 to March 1890, the disease has gradually been growing less prevalent, the deaths reported in the latter month being more than 2,000 less than in October last.

I remarked last year, when reviewing the statistics of mortality, that the mortality classed as due to diarrhœa and dysentery should be attributed to rinderpest, and I have no doubt on this point; so in this year it will be noticed that almost as many deaths have been reported from these causes as from rinderpest, viz., 30,368. I am sure that these cases with but few exceptions have been due to rinderpest, and it is but reasonable to conclude that they have been erroneously reported. If, therefore, they are included in the mortality caused by rinderpest, we have a grand total of 68,620, more than 75,000 less than in the year 1888-89.

The districts which suffered most from the ravages of rinderpest, including also the cases reported under diarrhœa and dysentery, were North and South Arcot, Malabar, Kurnool, Kistna, Cuddapah, Chingleput, Tanjore, Madura, Anantapur, Ganjam and Nellore.

Anthrax.—This disease caused more loss during the past year than in 1888-89, but was far less prevalent than rinderpest; it was most virulent in the months of August, September and October and considerably decreased in February and March last; the total loss reported from the Presidency from this cause for the past year was 22,502. The districts which suffered most being North Arcot, Kistna, South Arcot, Cuddapah, Chingleput and Tanjore.

Epizootic Aphtha.—The mortality from this cause was considerable and greater than in the previous year; the total deaths numbered 7,811, which represents a very large number of attacks. The months of December, January and February were the most fatal months probably, because, of inclement weather, cold, &c., operating on debilitated animals. The districts of Ganjam and Trichinopoly suffered most.

Variola—was not very prevalent, 3,290 deaths being reported from this cause; most casualties from this disease occurred in November, and the districts of Vizagapatam and Coimbatore were mostly affected. No deaths from this disease were reported from Ganjam, Godávari, Chingleput, South Arcot and Nilgiris.

Other Diseases.—Deaths from the above causes were numerous, 26,243 being reported from the Presidency; from July to January most deaths occurred, and the districts of Ganjam, Vizagapatam, Godávari and Kistna reported most cases. The total loss of cattle from disease during the past year is reported to be 128,466, which shows a great decrease when compared with the mortality of the previous year.

SHEEP AND GOATS.

The mortality of sheep from rinderpest, anthrax, epizootic aphtha, and diarrhœa and dysentery was greater than in the previous year, being in all 39,599. The greatest loss reported is under the head of Other diseases, 13,615; Variola ovina caused nearly 8,000 deaths. Epizootic aphtha was not very severe, for out of 2,836 deaths from this cause, it is reported that about 1,200 deaths were caused in the Bhadráchalam taluk, Godávari, by bad weather during November last. The greatest mortality from disease occurred in November and December, and the districts of Anantapur, Bellary and Cuddapah reported most deaths.

HORSES AND PONIES.

One hundred and fifty-three horses and ponies are reported to have died from disease during the year, which is a considerable increase in number over the mortality of the previous year—anthrax (9), diarrhœa and dysentery (6), variola (4) and other diseases (134). Most mortality occurred in the month of July, and the districts of Anantapur and Coimbatore reported most casualties.

I have made no remarks on the statistics relating to mortality from causes other than disease, as I did not deem it necessary.

APPENDIX V—1.

STATISTICS of Mortality among Cattle in each District of the Presidency of Madras during the official year 1889-90.

Districts.	Total stock.	Number of deaths due to disease.								Number of deaths due to other causes.							Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphthæ.	Variola.	All other diseases.	Total.		Natural decay.	Accidents.	Snakebites.	Poisoning.	Wild animals.	Total.		Number.	Rate per mille.
								Number.	Rate per mille.						Number.	Rate per mille.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Ganjam ..	232,900	2,238	655	1,468	2,393	..	5,530	7,851	33	709	* 13,143	22	..	36	13,910	60	21,761	93
2. Vizagapatam.	120,400	255	1,876	337	64	1,267	2,746	4,328	35	1,727	42	23	1	34	1,827	15	6,155	50
3. Godávari ..	589,600	925	204	107	151	..	2,570	1,397	2	5,113	192	92	..	289	5,686	10	7,083	12
4. Kistna ..	964,200	3,792	1,595	2,500	227	130	2,152	10,990	11	18,985	1,500	237	..	191	20,913	22	31,903	33
5. Nellore ..	598,800	482	2,047	860	429	67	1,727	6,455	10	4,671	299	78	2	64	5,114	9	11,569	19
6. Kurnool ..	582,700	3,531	1,859	1,142	198	27	1,715	12,287	21	7,171	726	152	..	460	8,509	15	20,796	36
7. Bellary ..	600,800	700	97	739	44	89	1,480	3,821	6	7,180	565	22	3	201	7,971	13	11,792	19
8. Anantapur ..	587,700	2,264	635	1,086	485	40	1,097	5,907	10	5,501	393	29	1	169	6,093	10	12,000	20
9. Cuddapah ..	985,200	1,160	3,590	2,220	266	249	529	9,200	9	7,015	620	97	5	503	8,240	8	17,440	17
10. North Arcot.	731,900	2,111	4,615	4,440	265	1	10	12,157	17	13,007	436	330	..	527	14,300	19	26,457	36
11. Chingleput ..	407,900	1,200	2,749	2,185	324	..	1,397	7,938	19	10,619	273	449	..	45	11,386	28	19,324	47
12. South Arcot.	984,700	4,519	1,943	2,394	299	..	725	10,161	10	7,208	233	232	..	90	7,763	8	17,924	18
13. Salem ..	967,300	411	411	50	78	106	1,006	1,462	1	1,365	158	57	..	491	2,071	2	3,473	3
14. Coimbatore ..	1,183,900	890	1,560	309	187	587	1,229	5,260	5	7,209	397	137	..	792	8,535	7	13,795	12
15. Trichinopoly.	592,600	1,281	2,305	185	1,013	91	714	5,589	9	12,293	486	194	..	73	13,046	22	18,635	31
16. Tanjore ..	823,500	2,645	979	1,872	226	12	378	6,963	8	11,544	269	165	1	6	11,985	15	18,948	23
17. Madura ..	637,600	2,982	498	151	80	281	213	4,370	7	5,196	406	148	2	315	6,067	9	10,437	16
18. Tinnevelly ..	483,800	455	709	107	260	79	138	1823	4	4,456	96	126	..	64	4,742	10	6,565	14
19. Nilgiris ..	59,000	198	29	2	120	..	346	487	8	1,480	219	3	..	418	2,070	35	2,557	43
20. Malabar ..	901,200	4,362	1,967	201	242	124	337	7,233	8	15,599	400	258	..	2,876	18,633	21	25,866	29
21. South Canara.	663,900	1,851	45	147	460	140	204	2,847	4	15,850	1,261	44	..	3,373	20,528	31	23,375	35
Total ..	13,699,600	38,252	30,368	22,502	7,911	3,290	26,243	128,466	9·3	163,848	22,114	2,895	15	10,517	199,389	14·6	327,855	23·9

* About 13,100 of these deaths occurred in November owing to exposure from storm.

APPENDIX V—2.

STATISTICS of Mortality among Sheep and Goats in the Presidency of Madras during the official year 1889-90.

Districts.	Total stock in the district.	Number of deaths due to disease.								Number of deaths due to other causes.							Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola (sheep-pox).	All other diseases.	Total.		Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild animals.	Total.		Number.	Rate per mille.
								Number.	Rate per mille.						Number.	Rate per mille.		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17.	18	19
1. Ganjam ..	60,100	762	48	238	109	..	215	1,372	23	38	5,908	..	..	22	5,968	99	7,340	122
2. Vizagapatam	41,600	330	887	10	4	1,587	252	3,070	74	617	48	..	..	152	817	19	3,887	93
3. Godávari ..	114,200	191	..	317	* 1,611	3	..	2,122	18	655	248	2	..	71	976	9	3,098	27
4. Kistna ..	486,900	8	199	44	87	..	1,182	1,520	3	1,654	217	9	..	413	2,293	5	3,813	8
5. Nellore ..	553,900	33	286	157	19	19	1,682	1,896	3	1,440	480	8	..	312	2,240	4	4,136	7
6. Kurnool ..	554,400	469	283	378	42	82	1,560	2,814	5	524	250	23	..	953	1,750	3	4,564	8
7. Bellary ..	681,400	34	109	1,587	..	232	2,515	4,477	7	3,547	514	..	..	244	4,305	6	8,782	13
8. Anantapur ..	936,200	121	595	823	216	2,636	2,023	6,414	7	2,040	323	3	2	650	3,018	3	9,432	10
9. Cuddapah ..	1,138,700	737	599	953	7	1,293	756	4,345	4	1,414	340	14	..	1,778	3,546	3	7,891	7
10. North Arcot.	668,000	259	298	428	1	586	62	1,634	2	2,283	90	21	..	529	2,923	4	4,557	6
11. Chingleput ..	259,900	11	75	66	54	476	122	804	3	1,769	52	31	..	276	2,128	8	2,932	11
12. South Arcot.	745,400	542	127	25	249	..	636	1,579	2	764	6	3	..	63	836	1	2,415	3
13. Salem ..	980,700	1	45	13	1	69	194	323	..	640	52	23	..	643	1,358	1	1,681	1
14. Coimbatore ..	1,255,860	39	168	157	70	114	1,890	2,438	2	5,161	1,277	41	..	1,411	7,890	6	10,328	8
15. Trichinopoly.	905,300	23	217	82	146	133	219	820	1	8,152	778	62	..	509	9,501	10	10,321	11
16. Tanjore ..	445,100	5	3	..	..	1	24	33	..	1,103	54	1	..	40	1,198	3	1,231	3
17. Madura ..	696,100	737	69	312	57	246	490	1,911	3	3,135	808	49	..	214	4,206	6	6,117	9
18. Tinnevelly ..	788,000	187	1,031	64	149	485	89	2,005	2	5,310	322	38	..	521	6,191	8	8,196	10
19. Nilgiris ..	6,200	1	..	..	14	..	1	16	2	35	5	..	..	15	55	9	71	11
20. Malabar ..	62,300	2	1	..	..	..	1	4	..	361	19	..	..	194	574	9	578	9
21. South Canara.	9,500	..	..	..	..	..	2	2	..	57	24	1	..	40	122	13	124	13
Total ..	11,389,700	4,492	5,040	5,654	2,836	7,962	13,615	39,599	3·5	40,699	11,815	329	2	9,050	61,895	5·4	101,494	8·9

* About 1,200 of this number occurred in Bhadráchalam taluk owing to bad weather during November 1889.

APPENDIX V—3.

STATISTICS of Mortality among Horses and Ponies in each District of the Presidency of Madras during the official year 1889-90.

Districts.	Number of deaths due to disease.					Number of deaths due to other causes.					Total deaths from all causes.
	Anthrax.	Diarrhœa and dysentery.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Wild animals.	Total.	
1	2	3	4	5	6	7	8	9	10	11	12
1. Ganjam						2				2	3
2. Vizagapatam			1		1	6			4	10	10
3. Godávari				4	4	55	6	1	3	65	69
4. Kistna				3	3	23				23	26
5. Nellore			1	18	19	55	11	1	15	82	101
6. Kurnool	1			12	13	63	8		23	94	107
7. Bellary	5	1	1	47	54	75	4		8	87	141
8. Anantapur	2		1	3	6	20	12	1	10	43	49
9. Cuddapah				4	4	28	2		7	37	41
10. North Arcot				7	7	28	4	5		37	44
11. Chingleput				1	1	14	1			15	16
12. South Arcot				2	2	10	1	1	4	16	18
13. Salem	1	2		26	29	24	3		19	46	75
14. Coimbatore						15				15	15
15. Trichinopoly				1	1	6				6	7
16. Tanjore				4	6	24	7		25	56	62
17. Madura		2		2	2	4	1			5	7
18. Tinnevelly						14	3	1	10	28	28
19. Nilgiris						11	2		1	14	15
20. Malabar		1			1	7	1		1	9	9
21. South Canara											
Total	9	6	4	134	153	484	66	10	130	690	843

APPENDIX VI.

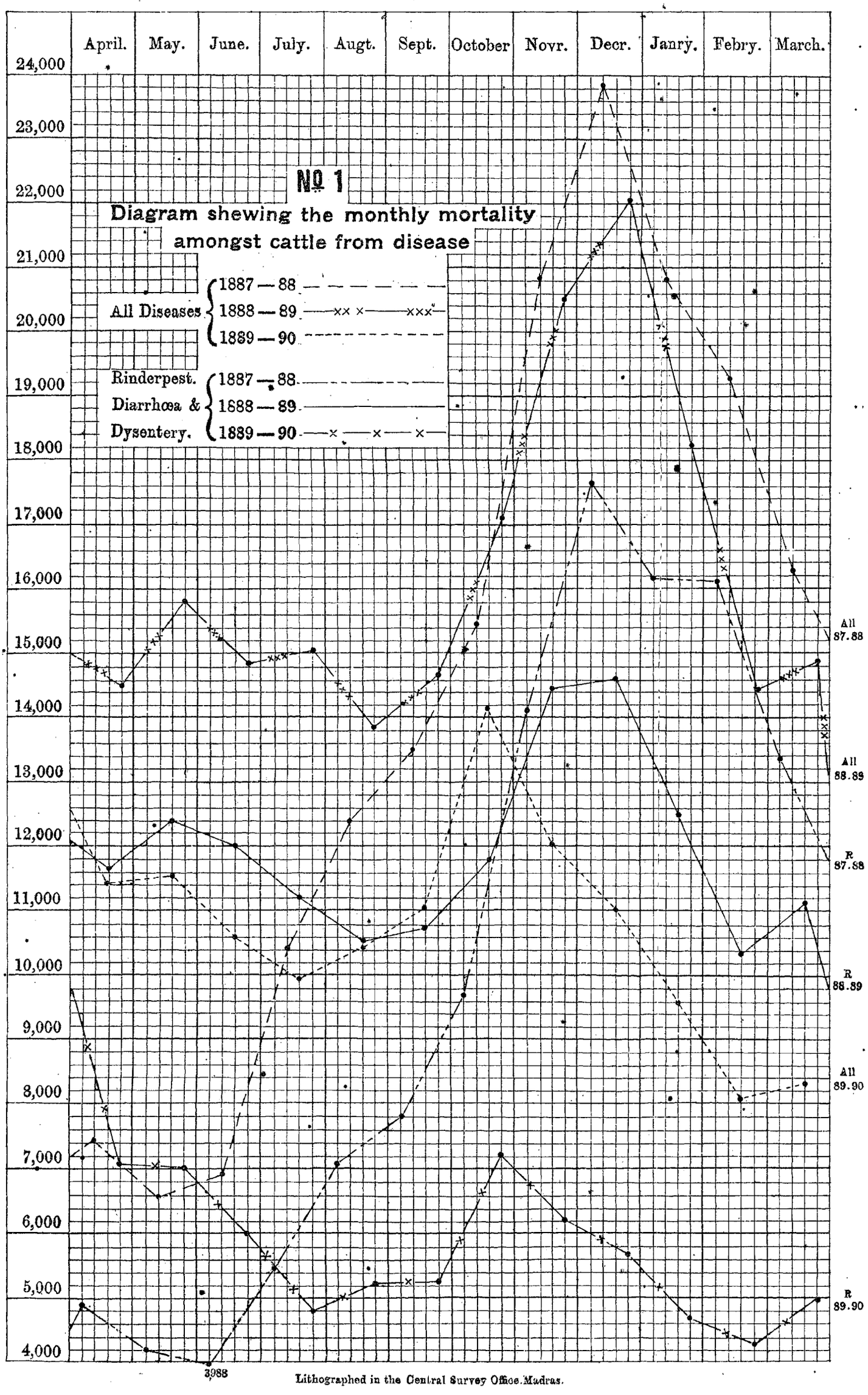
Monthly Statistics of Mortality among Cattle, Sheep and Goats and Horses and Ponies in the Madras Presidency during the year 1889-90.

Months.	Number of Deaths of Cattle due to													Total number of deaths from all causes.
	Diseases.							Other causes.						
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild Animals.	Total.	
April 1889	4,481	2,625	1,503	717	128	1,953	11,407	12,322	645	165	4	750	13,886	25,293
May ,,	3,623	3,407	1,825	297	436	1,981	11,569	12,731	789	190	..	678	14,388	25,957
June ,,	2,986	2,976	2,351	217	197	1,922	10,649	17,330	1,031	220	1	796	19,378	30,027
July ,,	3,080	1,700	2,161	215	175	2,598	9,929	16,281	931	229	4	1,002	18,447	28,376
August ,,	3,638	1,687	2,434	336	190	2,266	10,551	13,465	749	294	1	989	15,498	26,049
September ,,	3,130	2,136	2,550	609	235	2,352	11,012	11,734	851	321	3	852	13,761	24,773
October ,,	4,438	2,793	3,136	714	205	2,909	14,195	12,605	846	316	..	1,081	14,848	29,043
November ,,	3,274	2,892	1,937	815	661	2,459	12,038	12,921	* 13,791	310	..	896	27,918	39,956
December ,,	3,221	2,521	1,749	1,017	236	2,253	10,997	15,382	700	290	1	1,113	17,486	28,483
January 1890	2,364	2,336	1,100	1,038	348	2,440	9,626	13,470	550	173	1	910	15,104	24,730
February ,,	2,020	2,279	824	1,070	268	1,682	8,143	12,484	593	204	..	722	14,003	22,146
March ,,	1,997	3,016	932	766	211	1,428	8,350	13,123	638	183	..	728	14,672	23,022
Total ..	38,252	30,368	22,502	7,811	3,290	26,243	128,466	163,848	22,114	2,895	15	10,517	199,389	327,855

Months.	Number of deaths of sheep and goats due to													Total number of deaths from all causes.
	Diseases.							Other causes.						
	Rinderpest.	Anthrax.	Epizootic aphtha.	Diarrhœa and dysentery.	Variola (sheep-pox)	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Poisoning.	Wild animals.	Total.	
April 1889	615	579	11	829	950	1,397	4,381	3,554	1,292	13	..	488	5,347	9,728
May ,,	173	282	..	595	648	266	1,964	2,666	283	12	..	434	3,395	5,359
June ,,	349	285	44	71	434	118	1,301	2,210	340	14	..	450	3,014	4,315
July ,,	134	410	..	393	547	645	2,129	2,899	251	23	..	798	3,971	6,100
August ,,	216	281	159	132	340	1,064	2,192	2,621	292	27	..	893	3,833	6,025
September ,,	105	94	2	588	426	502	1,717	2,566	720	32	..	956	4,274	5,991
October ,,	403	559	480	212	752	2,037	4,443	4,718	1,289	43	..	1,126	7,176	11,619
November ,,	987	† 1,238	‡ 1,476	187	1,117	1,219	6,224	4,765	6,222	31	2	967	11,987	18,211
December ,,	387	461	150	240	795	3,445	5,478	4,346	300	38	..	981	5,665	11,143
January 1890	159	463	331	494	867	1,353	3,667	3,756	95	32	..	765	4,648	8,315
February ,,	312	505	81	374	636	727	2,635	3,226	194	23	..	623	4,066	6,701
March ,,	652	497	102	925	450	842	3,468	3,372	537	41	..	569	4,519	7,987
Total ..	4,492	5,654	2,836	5,040	7,962	13,615	39,599	40,699	11,815	329	2	9,050	61,895	101,494

* About 13,000 of this number occurred in Ganjam owing to exposure from storm.
† About 900 of this number occurred in the four districts of Godávari, Bellary, North Arcot and Anantapur. ‡ The bulk of this was reported from Bhadráchalam taluk, Godávari district.

Months.	Number of Deaths of Horses and Ponies due to										Total deaths from all causes.
	Diseases.					Other causes.					
	Anthrax.	Diarrhœa and dysentery.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bites.	Wild animals.	Total.	
April 1889	..	..	..	8	8	30	7	..	12	49	57
May ,, ...	..	..	..	14	14	40	5	..	10	55	69
June ,, ...	..	..	..	9	9	72	9	1	7	89	98
July ,, ...	1	1	..	30	32	45	11	1	10	67	99
August ,, ...	..	1	..	14	15	36	4	1	17	58	73
September ,, ...	1	..	1	4	6	39	6	..	7	52	58
October ,, ...	2	..	1	7	10	50	10	4	13	77	87
November ,, ...	..	1	..	4	5	34	3	..	14	51	56
December ,, ...	2	..	..	7	9	44	2	..	15	61	70
January 1890	..	..	2	12	14	32	7	..	9	48	62
February ,, ...	..	1	..	17	18	31	1	..	8	40	58
March ,, ...	3	2	..	8	13	31	1	3	8	43	56
Total ..	9	6	4	134	153	484	66	10	130	690	843



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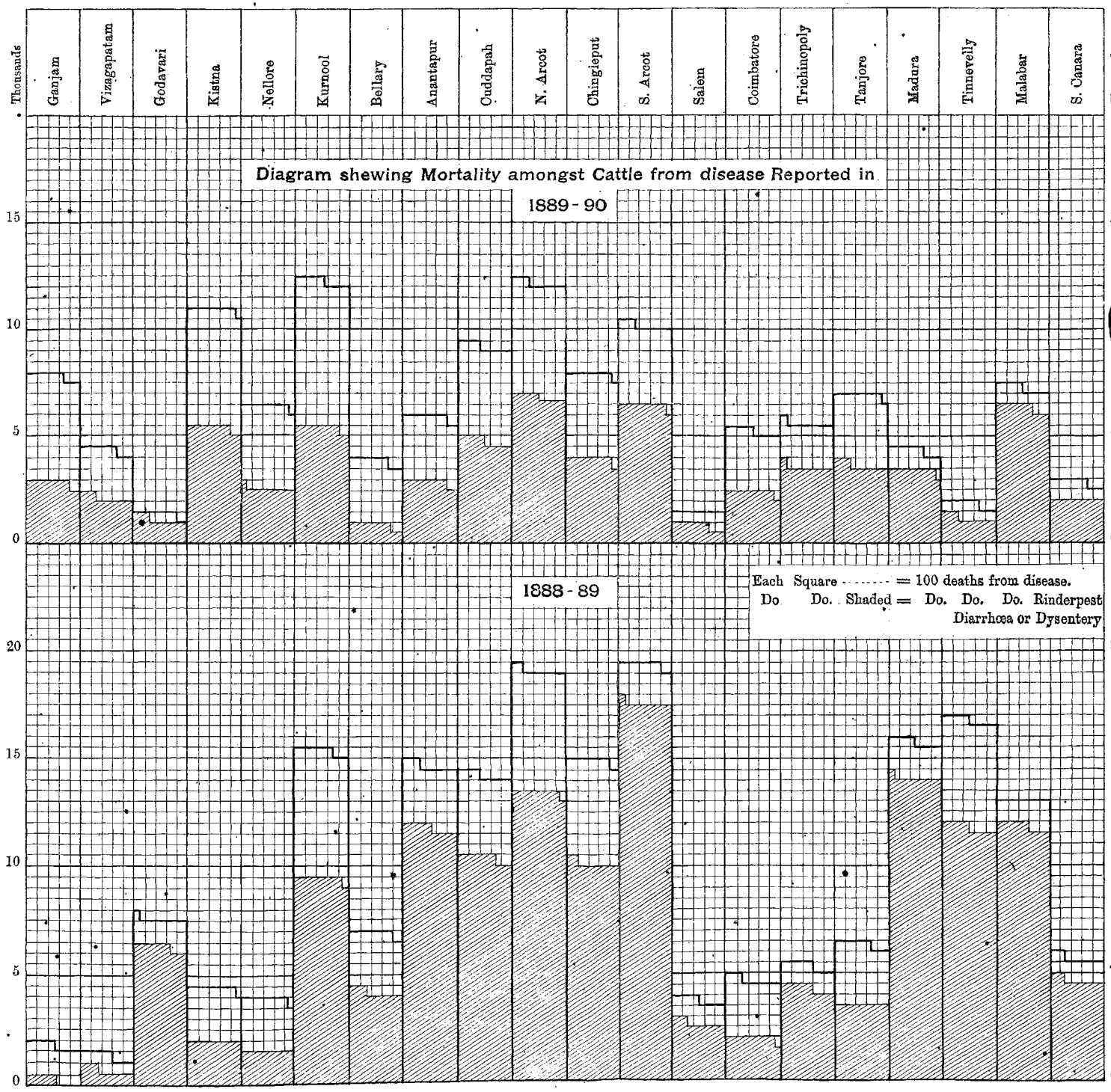
Lithographed in the Central Survey Office, Madras.



Lithographed in the Central Survey Office Madras.
1890.

Order—dated 28th January 1891, No. 57, Revenue.

Miscellaneous.

In the above Proceedings the Board submits its review of the operations of the Agricultural Department during the year 1889-90. When dealing with the review of the preceding year, the Government pointed out that the orders passed upon the Report of the Agricultural Committee settled definitely many of the questions raised during 1888-89, and the same may be said of the report now submitted. It is moreover observed that most of the subjects dealt with in the review of 1889-90 have already been disposed of in separate Proceedings.

2. The Government notes with pleasure that the progress made during the year under review in the preparation of the statistical registers, ordered in connection with the famine analysis of districts, was far more satisfactory than that recorded in the previous year, and trusts that every care is being taken to ensure the accuracy of these important accounts. The increase in the strength of the Revenue Inspector staff, recently sanctioned by the Secretary of State, should enable Collectors to exercise more efficient control over these and other returns, and the improvement in the qualifications of village officers, which may be looked for under the new system of test examinations, will doubtless tend to enhance the value of their work.

3. The results of the inquiries made by the Board in regard to the exports of animal bones from this Presidency and the extent to which they are used for the purposes of manure, are detailed in paragraph 21 *et seq.* of the review. The Board points out that so far from increasing in recent years, the exports of this article have diminished, and from the figures given it is evident, that the Madras export trade in bones is of small importance, as compared with that carried on in other parts of India. Various experiments with bone manure have from time to time been made in this Presidency, and the results have in all cases proved satisfactory. The ryots are, however, generally ignorant of the great fertilizing power possessed by bone dust, and it would be well to publish the facts recorded in the present review, together with such additional information as may be available, in the form of a bulletin for wide distribution.

4. The Government has already* reviewed the results of the experiments conducted by Mr. Caine in the growing and curing of foreign and indigenous tobaccos. For various reasons these experiments were not attended with success, and it has accordingly been decided to discontinue them.

* G.O., No. 843, dated 29th October 1890.

5. The ravages caused by cattle disease during the year 1889-90 and the measures of prevention adopted are fully reviewed in the Board's Proceedings. The total mortality of cattle from disease was 35 per cent. below that recorded in the previous year, the actual number of deaths being 128,466. Rinderpest with diarrhœa and dysentery accounted for more than half this number. The total number of sheep, goats, horses and ponies, reported to have died during the year from disease was 39,752, and the aggregate loss to the ryots under all heads is estimated at 13¼ lakhs of rupees. The mortality amongst the animals named in the last sentence was greater than that recorded in 1888-89, but the Commissioner is of opinion that this is in a great measure due to improved registration. The Government is inclined to accept this view of the matter, and to agree with the Commissioner that "the falling off under the head of cattle would probably have been greater but for the same reason."

6. The report called for in paragraph 16 of G.O., No. 515, dated 4th July 1890, regarding the transfer to the Settlement Department of certain subjects now dealt with in the Land Revenue Department, should be expedited.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

To the Commissioner of Revenue Settlement,
Land Records and Agriculture.

Copy to the Commissioners of Land Revenue.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1890-91.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1892.

134071

G.O., dated 25th January 1892, No. 86, Revenue:—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 3rd October 1891, No. 625:—

MR. CLOGSTOUN.

Resolution—dated 3rd October 1891, No. 625.

The Board resolves to submit the enclosed report reviewing the operations of the Department of Land Records and Agriculture during the year 1890–91 for the information of Government.

2. The department remained in charge of Mr. Clogstoun throughout the year. That officer was deputed to attend the Agricultural Conference at Simla early in October 1890, when Dr. Voelcker's suggestions for the improvement of Indian agriculture by scientific means were discussed. The Assistant Director was on furlough for six months from June 1890. The Inspector of Cattle Diseases, Mr. Hazelton, after having been on privilege leave during April and May, reverted to military duty in July, and the appointment was held in abeyance during the remainder of the year, it having been decided by the Local Government that its continuance was not advisable at present. The appointment of Deputy Inspector of Cattle Diseases, held by Mr. Shunker, was made permanent during the year. That officer is solely employed in charge of the pony-breeding operations in Coimbatore and Salem under the direction of the Collectors of those districts. The Sub-Assistant Director of Agriculture, after his return from privilege leave, was employed under the Inspector of Cattle Diseases until July when he was called into the Central office to carry on part of the duties usually discharged by the Assistant Director. Subsequent to the latter officer's return, he was employed in the office on statistical work.

3. The orders of Government on the report of the Agricultural Committee appointed in September 1888 were issued in July 1890, but it was not possible to take any direct action on this during the year. Pending the return of the Assistant Director from Europe, the question of locating the five farm schools sanctioned therein was held in abeyance and only reported on after the close of the year under reference. The sanction which was sought under these orders to the proposed abolition of the Cattle Disease Branch of the department was not received from the Government of India within the year, but it was found possible to reduce the subordinate staff somewhat by transfers to other departments. Towards the end of the year, the Stock Inspectors, who had been selected for charge of the veterinary hospitals ordered to be established in connection with the farm schools, were deputed to undergo a special course of study at the College of Agriculture, Saidápet. The revision of the curriculum of the last named institution, which was also ordered by the Government, formed matter for the deliberation of a committee of experts, whose work was completed shortly after the close of the year.

4. Employed as he was during the first two months of the year on secretarial and statistical work at Madras, absent on furlough for six months and during the remaining months of the year engaged as he was partly in inspecting and reporting on the facilities for starting farm schools at different centres and partly on his usual secretarial duties, the Board does not consider it necessary to enter into fuller detail as to the manner in which the Assistant Director was employed except to note that during the latter part of March he visited Nagpore, Cawnpore, Bhadgaon, Poona and Sholapur with a view to making himself acquainted with the working of the agricultural institutions existing at those places. For the most part, his duties were those of Secretary to the Director.

5. The work of the department is dealt with in the report under the headings prescribed by the Government of India.

(A true Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Order—dated 25th January 1892, No. 86, Revenue.

Miscellaneous.

The Board submits its annual report on the operations of the Department of Land Records and Agriculture for the year 1890–91.

2. *Land Records.*—Two important questions connected with the administration and working of this branch of the department that were under consideration during the year under review were disposed of after its close: one related to the appointment of a special officer to assist the Director in the supervision of the subordinate Land Revenue officials in connection with the maintenance of Land Records and Survey marks, and the other to the introduction of a more efficient and economical system of keeping these records and maps up to date. The sanction of the Secretary of State for the creation of the new appointment was communicated by the Government of India in July last and the proposal to entrust the karnams with the duty of correcting the maps on which the correct maintenance of village records up to date more or less depends was sanctioned in May. The nature of the measures adopted by the Board to ensure the speedy completion of the firka books, a work of much importance, should be reported. The statistical atlas should also be finished as soon as the results of the recent census are available.

3. *Agriculture.*—In accordance with the orders of Government, the Directors of Public Instruction and Agriculture submitted a joint report in May last (*i.e.*, two months after the close of the year) on the subject of the agricultural schools and farms that it is proposed to open at or near the head-quarter station of five representative districts in the Presidency. Various difficulties have arisen in deciding the terms upon which these institutions are to be started, and the report of the Directors is still under the consideration of Government. In the meantime but little has been or could be done by the department in the matter of promoting the stability and efficiency of agriculture in the Presidency, for the policy enunciated in G.O., No. 515, dated 4th July 1890, hinges to a great extent upon these agricultural farms and schools. The absence of the Assistant Director on furlough for six months of the year under review naturally put a stop to any progress in the way of agricultural experiments, and this, it is presumed, is the reason why the information called for by the Government of India in its Circular No. 12A—96-1, dated 11th June 1891, regarding the utilization of bone as manure, has not been furnished by the Director in his present report.

4. The Government of India has recently intimated that no officer is available to fill the post of Cattle Disease Inspector which it has been decided to retain and the office is therefore still vacant.

5. The statistics of cattle mortality from diseases are fully reviewed by the Board, but the figures showing deaths from natural decay are passed over with the remark that the "death-rate as reported amongst cattle from natural causes is so low as to render it certain that but a small portion of the deaths are reported, and having regard to the difficulty of securing accurate returns in this respect, it has been decided to give up the attempt." There is an apparent inconsistency between this passage and the Board's remark in the sentence immediately preceding it to the effect that the more complete registration of stock "scarcely keeps pace with improved reporting of mortality." It is unsatisfactory that the figures under this head are of such small value. His Excellency the Governor in Council is, however, of opinion that the attempt to secure fairly accurate returns should not be abandoned, and the Board should therefore reconsider its decision on the point.

(True Extract.)

(Signed) C. A. GALTON,
Secretary to Government.

REPORT OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE.

I.—Organization and Maintenance of Village Records.

1. The forms prescribed in the revised manuals of the village and taluk accounts were brought into use in fasli 1297 (1887–88), and the Collectors of districts were asked to submit special reports on the results of the working of these accounts after three years. These reports, which as yet have been received from only nine districts, show that the new accounts have been found to be a great improvement on the old and to be generally well suited for the purpose for which they are severally intended. Some modifications and improvements have been suggested by a few Collectors, which will be considered and disposed of as soon as the reports due from the other districts are received.

2. As usual the officers who conducted the annual settlements (jamabandi) carefully scrutinised the accounts and took the necessary steps to correct the defects and irregularities brought to notice. Their reports show that both village and taluk accounts are fairly well kept, though there is still room for improvement. The proper maintenance and upkeep of these accounts depends upon the degree of efficiency of the village establishments and the frequency and thoroughness of the supervision brought to bear on their work, and it is hoped that in both these matters considerable improvements will soon be effected. Reference was made in the previous report to a contemplated appointment of a special officer as a Personal Assistant to the Director to undertake the duty of inspecting the work of the subordinate Revenue establishments in the maintenance of land records and survey marks and plans. The sanction of the Secretary of State to the creation of this additional office provisionally for a period of five years was received after the close of the year.

3. The revision of the village establishments in the three Government taluks of Ganjam was sanctioned during the year. The proposals relating to Vizagapatam, Anantapur and Kurnool were under consideration. The revision of the staff of Revenue Inspectors, referred to in the previous year's report, was given effect to partially during the year, their number having been raised from 525 to 610. Their pay will eventually be in two grades of Rs. 35 and 40 *per mensem;* but the new rates will be allowed only to those men who have passed the requisite tests, viz., the Revenue Test, Lower, and the Survey Test prescribed in G.O., dated 8th July 1885, No. 800. Of the 610 Revenue Inspectors now on the staff, 524 have passed the Survey Test, 104 having passed the test during the year under report.

4. During the year under report the question of the necessity for a re-survey of certain districts at the expiration of the Land Revenue settlements now current and of the agency by which the re-survey, if necessary, should be effected was under consideration.

The Superintendent of Revenue Survey, Mr. Cardozo, was deputed by Government in November 1890 to visit the Jhansi district in the North-Western Provinces with a view to ascertaining the details of the system of survey by village accountants (patwaris), which was in progress in that district and the utility of the work done. He was also asked to visit the Central Provinces where the various processes of survey were entrusted to the village establishment and to submit a full report embodying the results of his personal investigations in the two provinces. He accordingly made a tour in those provinces and submitted a report early in March 1891 with proposals for the re-demarcation and re-survey of the Trichinopoly district by the agency of the village karnams. He and the Commissioner of Revenue Settlement, to whom the report was referred for remarks, were of opinion that there was nothing in the circumstances of this Presidency or in the training and qualifications of its village officers to render unsuitable to this Presidency a system of survey which has been

reported to be eminently successful and economical in the North-Western and the Central Provinces. The proposals of the Superintendent of Survey for the re-survey of the Trichinopoly district through the agency of the village accountants were approved by Government in its order, dated 22nd May 1891, No. 446, Revenue, and it was directed that they should be given effect to at once. The work was commenced after the close of the year and is now making most satisfactory progress.

II.—The Analysis of Districts.

5. No further steps were taken to carry out any detailed analyses, and it was decided at the Simla Conference that these should be left to be worked out gradually as information was collected. This will be greatly facilitated by the preparation of the village registers of statistics, to the compilation and checking of which close attention was paid during the year. The progress made in these respects is shown in the following table for each district in the Presidency, as also is that in the compilation of the firka (Revenue Inspectors' range) books:—

Districts.	Number of villages								Remarks.
	In the district.	For which village registers have been				For which firka books have been			
		Prepared up to fasli 1299.		Checked up to fasli 1299.		Prepared up to fasli 1299.		Checked up to fasli 1299.	
		Completely.	Partially.	Completely.	Partially.	Completely.	Partially.	Completely.	Partially.	
1. Ganjam	1,533	..	60	..	60	..	..	..	..	The work is generally backward in all taluks.
2. Vizagapatam	201	201	..	201	..	170	..	170	..	
3. Godávari	1,379	1,265	21	1,248	2	420	338	371	348	The progress in the Ellore taluk is comparatively small.
4. Kistna	1,367	1,142	221	1,142	221	1,054	25	1,054	25	
5. Nellore	931	900	3	816	3	366	..	366	..	The firka books in Nellore, Rápúr and Gúdúr are in a backward state.
6. Kurnool	789	778	..	669	..	695	10	186	..	Entries in firka books were checked up to fasli 1299 only in Nandyál and Márkápur. In other taluks, a beginning has yet to be made.
7. Bellary	1,558	1,039	149	975	209	693	183	535	183	The progress in the preparation and checking of village registers is very poor in Kúdligi taluk, which contains the largest number of villages in the district. No entries were commenced for fasli 1299 in the firka books of Hadgalli; the progress in firka books is also poor in Adóni.
8. Anantapur	978	978	..	670	..	568	..	568	..	The checking of village registers is slow in Anantapur, Gooty and Dharmavaram taluks; the firka books of all taluks but Tadpatri, Dharmavaram, Penukonda and Madakasíra are in a backward state.
9. Cuddapah	1,340	1,339	..	1,339	..	1,189	..	1,053	..	
10. North Arcot	1,759	1,758	..	1,139	..	1,630	..	951	..	The entries relate to particulars for fasli 1300.
11. Chingleput	1,785	633	91	633	91	..	429	..	..	No village registers were checked for the current fasli in Saidápet and the progress in Chingleput and Ponnéri is poor. The entries in firka books for fasli 1299 have been commenced only in Tiruvallúr and Madurántakam taluks; in others nothing has been done.
12. South Arcot *	2,913	1,770	778	1,770	778	323	..	323	..	
13. Salem	2,806	2,768	..	2,768	..	2,428	..	2,428	..	
14. Coimbatore	1,508	1,436	..	1,094	38	843	92	..	..	The checking work of village registers is poor in Satyamangalam and Udamalpet; the progress with the firka books is poor in these taluks and *nil* in Kollegál and Pollách; no checking of the entries in firka books has been commenced in any taluk.
15. Trichinopoly	1,401	1,376	..	1,052	..	1,253	..	1,253	..	The checking of village registers is backward in Musiri.
16. Tanjore	3,604	3,557	..	3,557	..	17 firkas.†	..	17 firkas.	..	
17. Madura	896	560	7	322	175	..	182	..	..	Information for the Madura taluk is not yet available. The progress in the checking of village registers of Periyakulam and Dindigul is poor; except in Tirumangalam taluk no commencement has yet been made in the compilation of firka books.
18. Tinnevelly	1,139	1,034	70	1,034	70	142 villages and 4 firkas in 2 taluks.	..	142 villages and 4 firkas in 2 taluks.	..	
19. Nílgiris	36	36	..	36	..	36	..	36	..	

* Information as to the fasli year up to which the registers have been written up and checked has not been received.

† The total number of firkas of the district is 37.

6. The progress made is considerable, but, in the Director's opinion, the work should have been long since completed. The firka book and the subsidiary village registers give the Revenue Inspector a key to the state of his range, which is invaluable and which is not obtainable at present in any other form. These registers of course put similar information into the hands of all Revenue officers in authority, and their speedy preparation is a matter requiring the urgent attention of Collectors and Divisional officers. The Director will take special measures for bringing this work to a speedy completion as soon as the services of the Assistant Director of Land Records are obtained.

7. In order to amplify the information given by the statistics in the registers, instructions were issued during the year that the officers conducting the annual settlement should carefully examine the registers and make inquiries with the object of discovering any agricultural difficulties or any peculiarities in the economic condition of the people that may exist in any village or villages in each district, their inquiries being specially directed to—

(1) The character and condition of the irrigation sources of the villages, and whether any action regarding them is necessary.

(2) Whether there is much land lying unoccupied or uncultivated, and, if so, the cause.

(3) Whether the assessments are paid easily or only under coercion.

(4) Whether there is much tendency to extend cultivation or *vice versa*, and also whether relinquishment is frequent as a part of the agricultural system.

(5) Whether there is a large or small number of stock maintained, and whether changes in this respect are going on.

(6) Whether the outturn of crops is usually safe or always precarious.

(7) Particulars as to the public health and as to that of the stock.

Reports on the results of these inquiries have not yet been received, and will be noticed separately.

8. Some progress was made in the compilation of the statistical atlas alluded to in the last report, but nothing has been brought to completion, as it has been decided to await the results of the recent census before issuing the work.

III.—Collection of Revenue and Rental in Precarious Tracts.

9. The revision of the kistbandi or instalments of revenue carried out during 1889–90 has been attended with most satisfactory results throughout the Presidency. The instalments do not generally begin until the crops are ready for the market and the ryot is thus able to sell his produce to greater advantage and pay his revenue with greater readiness than before. During the year under report effect was given to the revised kistbandi (instalments of revenue) in Tanjore referred to in the previous year's report. The scheme for the remittance of Government revenue by means of postal money orders was experimentally tried in the districts of Chingleput, South Arcot, Tanjore, Madura and Tinnevelly. The report called for by the Board on the results of the working of the scheme at the end of one year has been received as yet from only two districts.

IV.—Measures of Protection.

10. *Season and Rainfall.*—With the exception of the four Northern districts of the Presidency, and Bellary, Kurnool, Tanjore and Trichinopoly, the season during the year 1890–91 was generally very unfavorable, and was exceptionally so in portions of the nine districts noted on the margin. In these districts the rains in the north-east monsoon were, as a rule, late and unusually scanty; and where the deficiency was subsequently made up, the rainfall was too unseasonable to do more than partial good. Many of the irrigation sources in these districts received little or no supply and a large extent of wet lands was left uncultivated, while the crops that were sown, both irrigated and unirrigated, suffered seriously from a deficient supply of water, large areas of lands in Chingleput and North Arcot having yielded nothing.

Nellore.	Madura.
Cuddapah.	Tinnevelly.
Chingleput.	Coimbatore.
North Arcot.	Malabar.
South Arcot.	

The areas affected in South Arcot and Madura were, however, comparatively small, and prospects, subsequently, so far improved in them that these two districts were left out of account when the question of relief measures for the affected tracts was considered during the last months of the year. Malabar too was left out of account, for, although there had been a considerable failure of the second rice-crop, the first crop had yielded fairly well. Excluding these three districts the area reported as affected by the season about the beginning of January 1891 was estimated at about 18,000 square miles, comprising the taluks of Nellore, south of the Pennér river, and the southern portion of the Venkatagiri zemindari; portions of the eastern and southern taluks of Cuddapah; the greater portion of the Kálahasti zemindari and the Wandiwash taluk in North Arcot; the northern taluks of Chingleput and portions of three others; seven taluks of Tinnevelly, including four which were only partially affected; and portions of the Coimbatore district. The aggregate population of this tract was over four million souls. In the third week of January, however, some unexpected rain fell in parts of the affected districts, and this was followed up by more rain in February and March which materially improved prospects, especially in Nellore, Madura, South Arcot and Tinnevelly, so that towards the end of the official year there seemed no ground for any serious anxiety except in portions of Chingleput, North Arcot, three taluks of Tinnevelly, and the Polláchi taluk of Coimbatore, comprising an area of 7,600 * square miles, out of a total area of these districts of nearly 23,300 square miles. These tracts began in January and February to exhibit unmistakable signs of distress and it was found necessary to provide relief work. The ordinary public works, however, supplemented by a few large additional works opened by the Public Works Department, coupled with increased expenditure on repairs to minor irrigation works and a liberal grant of loans under the Land Improvement Act, enabled the ryots and the laboring classes to tide over the distress during the closing months of the year without much difficulty. At the end of March about 100 minor irrigation works and 15 ordinary Public Works Department works were in progress in the five affected taluks of Chingleput, which gave employment to about 5,300 coolies. In the Wandiwash taluk and in the Kálahasti zemindari of the North Arcot district, about 2,100 people were employed on 31 minor irrigation works and nine Public Works Department works, while in Tinnevelly the numbers employed on 35 minor irrigation works started in the last week of March amounted to about 1,000. In the Polláchi taluk in Coimbatore, some 600 coolies were employed on a major irrigation work which was started in the worst tract. Kitchens for the distribution of cooked food to destitute women and children unable to work were ordered to be started in the affected tracts in the North Arcot district after a personal visit paid by His Excellency the Governor to the Wandiwash taluk on the 16th March. By the 31st March, three kitchens had been opened in the Wandiwash taluk and two in the Maderpâk division of the Kálahasti zemindari, in which some 300 people, mostly children, were being fed daily. In the Chingleput district it had not been found necessary up to the end of March to introduce this form of relief, though in one village six persons, who were very old and showed signs of emaciation, were admitted to grain-doles as a special case. In the nine affected districts referred to above, large remissions had to be granted to the amount of 13·1 lakhs of rupees for loss of crops. But for the unexpected rains which fell between January and March, the remissions would, as estimated by local officers, have been higher by at least three lakhs.

	SQ. MLS.
* Chingleput	2,300
North Arcot	1,300
Tinnevelly	3,700
Coimbatore	300
Total ...	7,600

11. *Communications.*—The portion of the Bellary-Kistna State Railway from Cumbum to Nandyál was completed during the year and the whole line from Guntakal to Bezváda was thus made available for traffic. A portion of the Villupuram-Dharmavaram Railway in South Arcot was also opened for traffic on 17th November 1890, and another portion, continuous with the above and connecting it with the Nellore branch, on 18th March 1891. The work on the East Coast Railway was vigorously proceeded with in the Northern districts, and the line from Tiruválúr to Mutupet in the Tanjore district was under construction. The survey of a line from Nellore to Bezváda, a

distance of 163¼ miles, with an 18 miles branch to Guntúr, and that of another line, 86 miles in length from Madras to Gúdúr, a station on the Nellore branch of the Villupuram-Guntakal State Railway, was also completed during the year.

12. *Irrigation.*—The Rushikulya works in Ganjam and the Periyár project in Madura were in progress during the year. The amount expended on the former during 1890–91 amounted to Rs. 4,54,570 and that on the latter to Rs. 10,60,170, raising the total expenditure to date to Rs. 18,34,270 and Rs. 26,66,102, respectively. A large sum of Rs. 4,70,979 was also spent during the year on the improvement and extension of the Kistna Delta system. The sanction of the Secretary of State was received for estimates amounting to Rs. 8,71,000 for improving and extending the Kalingaroyen channel in the Coimbatore district.

Minor Irrigation Works.—The original sanctioned allotment for the repair of the minor irrigation works was Rs. 4,00,000. The sum was subsequently raised to Rs. 4,60,000 to provide work for laborers in the affected tracts of North Arcot, Chingleput and Tinnevelly. The expenditure during the year amounted to Rupees 4,12,591, which is 89·70 per cent. of the allotment. This expenditure was the highest recorded since the transfer of these works to the control of the Revenue Department in 1883–84.

13. *Advances to Agriculturists.*—Proposals for the transfer of the control of the advances under the Land Improvement and the Agriculturists' Loans Acts and of the minor irrigation works from the Land Revenue to the Settlement branch of the Board of Revenue were under consideration during the year and have since been sanctioned. The following table shows the amounts advanced under the two Acts during each of the past five years :—

Year.	Land Improvement Loans Act.		Agriculturists' Loans Act.	
	Budget allotment.	Actual loans.	Budget allotment.	Actual loans.
	Rs.	Rs.	Rs.	Rs.
1886–87	2,00,000	8,057	1,00,000	19,100
1887–88	2,00,000	77,507	1,00,000	40,034
1888–89	2,00,000	1,30,622	1,00,000	36,772
1889–90	1,50,000	1,38,690	80,000	44,950
1890–91	2,41,900	2,27,942	58,100	43,562

V.—Agricultural Experiments.

14. *Farms.*—The only Government institution of this character in the Presidency is the farm attached to the College of Agriculture, Saidápet. The Director is in future to be consulted in all matters regarding the management of the institution, and the report thereon has been reviewed by him in a separate paper. The farm appears to be managed chiefly as a dairy farm, and so far was fairly successful during the year under report. The season was unfavorable and the yield of the field crops was not good. The cost of the farm could not be accurately determined, but it nearly paid its current expenses. So far, no special arrangements have been made as to the exact position the Director should hold with reference to the management of the farm or college, but the matter is under consideration.

15. *Agricultural College.*—The work of this institution is separately reviewed in the Educational Department, and it will suffice to note here that the junior department has been abolished since the close of the year, and that at the recent examinations the results were on the whole more satisfactory than in the previous year. The curriculum of the college formed matter for the deliberations of a committee of experts during the year, but, as yet, no action has been taken on their report.

16. *Farm-schools.*—The only step taken towards carrying out the orders of Government in this matter has been the preparation of a preliminary report on the facilities existing at several centres for starting such schools. Shortly before the end of the year, the Government of India objected to the system proposed by the Madras Government for adoption in this matter, on the ground that this department would lose control over the farms attached and that the institutions would become too

purely educational. The subject was then referred for joint report by the Directors of this Department and of Public Instruction who submitted a report in May last; nothing further has yet been decided. In the meanwhile, three selected Agricultural Inspectors have been sent to Kumbakónam, Coimbatore and Bellary to make themselves fully acquainted with local practices, in view to the probability of their being called upon to take charge of farms at these places which it has been proposed to start in connection with existing schools.

17. *Tobacco Experiments.*—The experiments conducted by Mr. Caine near Dindigul on the growth and curing of tobacco were brought to an end during the year, and Mr. Caine's connection with the department ceased. As the results were fully noticed in the report for last year, it is unnecessary to allude to them further here.

18. *Sugar.*—The discussion alluded to in paragraph 38 of the last report was continued during the year, and elicited a further valuable communication on the subject from Mr. F. M. G. Gill, in which he suggested the collection of information in detail regarding the canes grown, the methods in which they are treated, and analyses of the canes at different stages of growth; but, though this would no doubt be useful, it could not be undertaken on account of the cost of the analytical work it would require, and without which the remainder of the work would not be very valuable.

19. *Barley.*—During the year under report, prizes were again awarded for samples of barley grown on the Nílgiris. To secure proper competition samples were only allowed to be entered when produced in plots of half an acre or more, and the samples for exhibition were obtained direct from the threshing floors. There was a decline in the number of exhibits partly from the enforcement of the latter condition and partly owing to an unfavorable season, but, though the season was unfavorable, the samples were superior, for malting purposes, to those of the previous year. All the samples were raised from seed of English origin.

20. *Potatoes.*—In May 1890, the Government having regard to the deterioration of the quality of the potatoes grown on the Nílgiris, resolved to obtain 50 bushels of seed potatoes from England. The supply, which was obtained through the Secretary of State, only arrived in Madras in December 1890—far too late for immediate use. It was forwarded to the Nílgiris with instructions that the seed should be sold to growers at 10 lb. per rupee. The results will be alluded to next year.

21. *Eucalyptus leaves.*—Acting on a remark in the report of the Horticultural Gardens, Lucknow, that these leaves were a useful disincrustator for locomotive boilers, their use was suggested to the South Indian Railway and Madras Railway authorities, with the result that supplies were obtained for both for experimental use on the railways. The results obtained have not been communicated as yet.

22. *Societies.*—The Madras Agri-Horticultural Society, of the managing committee of which the Director of the Department is an *ex-officio* member, continued its work on the usual lines during the year. It received a Government grant of Rs. 4,000, and a private income from subscriptions of Rs. 3,093. Its total receipts amounted to Rs. 16,647. Its expenditure occurred chiefly under establishment, Rs. 5,062; seeds and plants, Rs. 3,260; and improvement of gardens, Rs. 3,463; and amounted in all to Rs. 17,316. By the sale of seeds and plants it realised Rs. 5,226. There is nothing in the report of the society to show that any work of agricultural interest was done during the year.

23. *Exhibitions.*—No shows of any sort were held during the year, nor was it considered advisable, in reference to the unfavorable state of the season, to make any arrangements for carrying out the orders of Government as to the initiation of special pony and cattle shows of a simple nature in any of the chief breeding districts.

24. *Agricultural implements.*—There is nothing special to report under this head this year. The iron sugar mills continue to spread over the country, and there is ample evidence that the heavy iron cotton-soil ploughs continue in favour in the Bellary district, where the ryots often hire them at the rate of Rs. 12 per mensem for breaking up foul or waste land with teams of 4 or 5 yoke of oxen.

Endeavours are being made to introduce the bamboo seed-drill of the Ceded Districts into Ganjam, but so far the Collector has not had much success for want of really competent workmen to manage the instrument. Arrangements are being made to supply this want.

VI.—Cattle Breeding and Veterinary Establishments.

25. *Pasturage and Fodder.*—Although the administration of forests does not fall to this department, the subject is one of the greatest agricultural importance and the orders issued during the year regarding the provision of pasturage, fodder, fuel and small timber for the agricultural population may be briefly referred to. Up to the passing of these orders, the idea generally prevailed that as soon as a forest was reserved, cattle and men were to be excluded, and it is to be worked for the profit of the Government rather than for the benefit of the people. The Government has now emphatically declared that the chief object of the reserved forests throughout the greater part of the country is the provision of pasture, small timber, fuel and leaves for manure or litter, and that they are to be worked in order to meet the wants of the villagers in these respects and are not to be converted into close reserves for the growth of large timber. Speaking generally, the forests in the plains are to be worked as fuel and fodder reserves and those on the hills as high forests, portions of the former being thrown open for public use on definitely settled plans suited to the circumstances of each locality.

The idea of forming village forests was given up and the taluk was ordered to be taken up as the unit for purposes of fuel and fodder reserves. If, in any case, the area already taken up is not found sufficient to furnish the estimated requirements in firewood, leaves and small timber, and to afford grazing for all cattle necessary for agricultural or domestic purposes, more land is to be brought under management and the natural growth supplemented by plantations created for the purpose of fuel supply.

It was also decided that cattle maintained for agricultural and domestic purposes must have the first claim on Government reserves, the number of such cattle which a ryot should be allowed to graze at favorable rates being regulated with reference to the average area cultivated by a pair of tilling cattle in each taluk. The maximum scale of fees leviable on each pair of bullocks and the milch-cow or she-buffaloe thus allowed for an average holding has been fixed at half the maximum rates prescribed in the case of reserved lands and reserved forests, but in exceptional cases, the Collector may reduce the fees or remit them altogether. Pasturage for the surplus animals is to be provided for in unoccupied and unreserved land if there is no room for them in the fodder reserves, the requirements of large cattle breeders being usually met in the large grazing grounds of hill tracts.

On all unoccupied unreserved land, the grazing of cattle, the cutting of grass, the collection of dry wood, thorns, leaves of trees and shrubs that are not reserved, and the felling of trees other than reserved trees, will continue to be permitted free of charge, provided that the grass, wood, leaves, &c., are required for agricultural or domestic purposes and not for sale or barter.

26. The general failure of the grasses in the southern portions of the Eastern Ghâts during the current year has been pointedly brought to notice by Mr. LeFanu, Collector of North Arcot, who writes as follows from Kálahasti in July last: "Cattle are dying. I have seen them dead in the fields and others too weak to rise; this too in a richly wooded country where grazing is free, a fact which gives ground for reflection in reference to our forest reserves. It is a fact that these great forests of the Eastern Ghâts contain no grass, and as cattle are not 'browsers,' they are practically useless as grazing reserves." The question has been referred by Government to the Forest Department for remarks. Any steps which can be taken for promoting the growth of hardy grasses in forest reserves will be of incalculable benefit to the agricultural classes in times of drought. The losses of cattle during the current year in the distressed tracts of the Presidency have been appalling notwithstanding the opening of all forest reserves.

27. *Pony Breeding.*—During the year the operations were brought to an end on the Nílgiris, and the stallion previously stationed there was transferred to Coimbatore. One stallion in the latter district was condemned and sold. One new stallion was purchased and sent to Salem. At the end of the year there were six stallions stationed in Coimbatore and five in Salem.

During the year 509 mares were covered by the stallions—190 in Salem, 308 in Coimbatore and 11 in Nílgiris. In Salem, the average number of mares per stallion which worked the whole season was 56 and in Coimbatore 63. This was much more satisfactory than the work done in the previous year.

The inquiries made as to the results of the coverings effected during 1889 elicited information regarding only 289 mares in Coimbatore and Salem. The results show that only 22 per cent. of the mares in Coimbatore and 38 per cent. in Salem, or, on the whole, 26 per cent. foaled. These results are considerably better than those of the preceding year and about the same as those obtained in 1887, but they are considerably worse than those obtained in Bengal and Bombay, whilst there is no reason to believe that the accuracy of the reports differs greatly as to either Presidency.

Castration operations were continued in both districts during the year. The number of castrations effected in each district since the commencement of the operations is as follows:—

——	1886-87.	1887-88.	1888-89.	1889-90.	1890-91.
Salem	68	288	121	134	156
Coimbatore	16	67	107	95	45

In Salem, two salustries and one pupil were engaged on the work, and in Coimbatore, one salustri under Mr. Shunker's supervision. The number of castrations in Salem is naturally smaller than it was in the early days of the experiment, but is still considerable. In Coimbatore, the numbers have always been small, and during the past year, the work has not been satisfactory.

The whole of the operations are being supervised by Mr. Shunker whose continued employment was sanctioned permanently during the year. The cost amounted to Rs. 5,082 including Rs. 600 paid for the new stallion, but excluding Mr. Shunker's pay and allowances.

28. A proposal was made towards the end of the year by a planter on the Nílgiris whereby he should carry on mule breeding operations with Government assistance, but the negotiations entered into in the matter were not finally concluded during the year under report.

29. *Cattle disease.*—Mr. Hazelton, who was in charge of the operations of the department in this respect, proceeded on two months' privilege leave early in April and shortly after his return reverted to military duty. The appointment was not filled up, as the Government determined in July 1890 to suspend all direct action in attempting to combat disease amongst live stock. It was at the same time proposed that the veterinary officer thus set free should become Veterinary Vice-Principal of the College of Agriculture, and should also supervise five small veterinary hospitals which it was proposed to attach to the farm-schools alluded to above. Towards the end of the year, however, on objection to this arrangement being taken by the Government of India, the Madras Government consented to maintain the office of Inspector of Cattle Diseases, but on the condition that the officer filling it should be engaged on *investigation only*. It has not yet been filled up, nor has it been decided what the duties of the post will be in future.

The Sub-Assistant Director of Agriculture worked under the orders of the Inspector of Cattle Diseases during June and July and visited the Nellore district to examine the work of the Stock Inspectors employed there at the time. During the remainder of the year he was employed in the Board's office at Madras. No settlement has as yet been arrived at regarding the manner in which he is to be employed in the future.

30. At the commencement of the year, 18 Stock Inspectors were employed under the department, allotted one each to different districts. In its orders of July 1890, the Government resolved that, except the selected few who would be required for charge of the proposed veterinary hospitals, the staff should be broken up and notices were issued accordingly. The carrying out of this decision was, however, held in abeyance pending the result of a necessary reference to the Government of India regarding the proposed abolition of the post of Inspector of Cattle Diseases. The result of that reference has been noted above; meanwhile four Inspectors left the department, having obtained appointments in other branches of the public service. At the end of the year fourteen Inspectors remained on the strength of the department. Of these, six were selected in January last to undergo a special course of training at Saidápet to prepare them for their future duties when put in charge of the veterinary

hospitals to be started in connection with the farm-schools. In March, three more were placed on special duty in connection with the operations for the relief of distress.

The cattle disease preventive work done by the staff is noted in full in the appendices to the report of the Inspector of Cattle Diseases which is attached. The total cost of this branch of the department was Rs. 29,062, including Rs. 7,352, being the pay and allowances of the Deputy Inspector of Cattle Diseases in charge of pony-breeding operations and of the Sub-Assistant Director of Agriculture.

31. Act II of 1866 has been withdrawn from operation in all districts, and the Government has decided not to put it in force again for the present except in connection with the regulation of large cattle markets and fairs. The provisions of the Act were utilised during the year in connection with the Chittrai festival at Madura and the Subramania cattle fair in South Canara. The arrangements for working it at these fairs were made by the Stock Inspectors attached at that time to those districts.

32. The following is an abstract of the mortality recorded amongst all classes of stock in the Presidency during the past four years:—

Causes of death.	Cattle.			
	1887–88.	1888–89.	1889–90.	1890–91.
Diseases—				
Rinderpest	116,558	95,795	38,252	21,970
Diarrhœa and dysentery	3,966	47,946	30,368	27,907
Total ..	120,524	143,741	68,620	49,877
Anthrax	34,482	19,893	22,502	18,586
Foot-and-mouth diseases	2,763	5,260	7,811	6,064
Variola	733	2,841	3,290	2,214
All others	15,771	24,529	26,243	25,356
Total from diseases ..	174,223	196,264	128,466	102,097
Others—				
Natural decay	33,535	129,471	163,848	197,736
Accidents	45,857	9,009	22,114	9,629
Snake-bites	1,824	2,587	2,895	2,698
Wild animals	7,591	9,520	10,517	10,533
Criminal poisoning	44	85	15	24
Total from other causes ..	88,851	150,672	199,389	220,620
Grand Total ..	263,074	346,936	327,855	322,717

Causes of death.	Sheep and Goats.				Horses and Ponies.			
	1887–88.	1888–89.	1889–90.	1890–91.	1887–88.	1888–89.	1889–90.	1890–91.
Diseases—								
Rinderpest	5,180	4,075	4,492	2,172	..	..	..	..
Diarrhœa and dysentery	959	4,363	5,040	4,741	2	5	6	15
Total ..	6,139	8,438	9,532	6,913	2	5	6	15
Anthrax	1,816	3,253	5,654	5,211	3	5	9	17
Foot-and-mouth diseases	211	989	2,836	926	..	..	..	..
Variola	3,373	7,387	7,962	8,156	..	1	4	8
All others	5,430	9,212	13,615	8,771	34	88	134	159
Total from diseases ..	16,969	29,279	39,599	29,977	39	99	153	199
Others—								
Natural decay	5,851	30,174	40,699	47,606	11	256	484	574
Accidents	20,106	11,585	11,815	4,278	59	68	66	64
Snake-bites	78	241	329	192	2	11	10	3
Wild animals	3,609	7,364	9,050	7,921	29	96	130	144
Criminal poisoning	..	23	2	..	..	..	..	..
Total from other causes ..	29,644	49,387	61,895	59,997	101	431	690	785
Grand Total ..	46,613	78,666	101,494	89,974	140	530	843	984

Considering the circumstances of the country and with the existing stock, an annual total mortality of one and-a-half million head of cattle would not be surprising,

so that the proportional loss from disease is not at all a serious one, though in some individual cases the loss of his cattle may mean ruin to the individual.

33. The rate of reported mortality per mille for the last four years has been as follows :—

Description of stock.	From disease.				From other causes.				From all causes.			
	1887–88.	1888–89.	1889–90.	1890–91.	1887–88.	1888–89.	1889–90.	1890–91.	1887–88.	1888–89.	1889–90.	1890–91.
Horned cattle ..	1·5	14·0	9·3	6·8	21·3	11·3	14·6	14·7	22·8	25·3	23·9	21·4
Sheep and goats ..	1·7	2·6	3·5	2·4	3·2	4·3	5·4	4·8	4·9	6·9	8·9	7·1
orses and ponies ..	1·1	2·5	3·3	4·6	4·0	10·7	17·5	18·1	5·1	13·2	21·3	22·7

These figures are based on the number of stock reported to exist in the Presidency, which has been taken in round numbers as follows :—

Years.	Horned cattle.	Sheep and goats.	Horses and ponies.
1887–88 ..	11,522,800	9,574,800	35,000
1888–89 and 1889–90 ..	13,700,000	11,400,000	19,250
1890–91	15,062,600	12,646,700	43,400

The increase in the number of stock is no doubt largely due to more complete registration, but this probably scarcely keeps pace with improved reporting of mortality. The death-rate as reported amongst cattle from natural causes is so low as to render it certain that but a small portion of the deaths are reported ; and having regard to the difficulty of securing accurate returns in this respect, it has been decided to give up the attempt. The mortality reported amongst sheep and goats does not include animals slaughtered for food, and as to neither description of stock are any returns included for the City of Madras. An examination of the detailed tables given in the appendix shows that the registration is particularly bad in the following districts which have shown the following rates of mortality per mille amongst cattle during the past three years :—

Districts.	1888–89.			1889–90.			1890–91.		
	Disease.	Other causes.	All causes.	Disease.	Other causes.	All causes.	Disease.	Other causes.	All causes.
				NO.	NO.	NO.	NO.	NO.	NO.
Ganjam	7·6	4·0	11·6	33	60	93	21	3	24
Vizagapatam	10·8	7·4	18·2	35	15	50	14	8	22
Godávari	12·8	6·8	19·6	2	10	12	5	12	17
Nellore	6·6	6·8	13·4	10	9	19	7	11	18
Cuddapah	14·4	5·9	20·3	9	8	17	7	9	16
South Arcot	19·7	6·6	26·3	10	8	18	9	11	20
Salem	3·9	1·9	5·8	1	2	3	1	3	4
Coimbatore	3·9	4·6	8·5	5	7	12	5	10	15

The higher figures of mortality from causes other than disease reported from Ganjam in 1889–90 were due to a large number of accidental deaths due to exposure to a cyclone—a cause which probably operated in Vizagapatam also.

34. The decrease in the mortality amongst cattle from disease, which, as was pointed out in paragraph 59 of the last annual report, had been going on steadily during the later months of the preceding year, continued until June 1890, when the low figure of 6,756 only was recorded. From then to October, however, the usual gradual increase in the death-rate occurred ; but, it may be suggested on account perhaps of the failure of the north-east monsoon rains after that date, it again fell away till January, after which there was a slight increase during the later months of the year. The variations are shown in diagram No. 1 in the appendix. Compared with the three previous years, the losses were small and only in one month (October) did they

exceed 10,000, whilst for eight months they did not reach 9,000. The total losses were only 102,000 against an average of 166,000 in the three previous years. Whilst this large actual decrease in the number of deaths reported has occurred, there is reason to believe that the accuracy of registration is improving.

The mortality from rinderpest, including under that heading those attributed to diarrhœa and dysentery as well, showed a similar decrease, and, compared with the enormous losses of the two years 1887–88 and 1888–89 was trifling throughout the year, as it never reached 4,600 in any one month and sunk as low as 3,234 in June 1890, the nearest approach to which in the three previous years having been 3,988 in June 1887. The proportion of the total number of deaths from disease which were attributed to this disease during the year under report was under 49 per cent. against 71 per cent. during the two disastrous years alluded to. This disease is, however, still by far the most destructive one from which the stock of the country suffers, and even at the comparatively low rate of the last year, the losses are sufficiently great to justify considerable efforts to put a stop to them. In round numbers 50,000 head of cattle perished from this disease in Government villages, and they would be worth at least 7½ lakhs of rupees.

The losses from other diseases were also less than in the previous year, although those attributed to "foot-and-mouth" disease continued large. As this disease is seldom fatal, the reported losses, 6,064 head, must represent a very large amount of suffering and deterioration of the stock in the hands of the ryot. Anthrax, though less fatal than in the three previous years, carried off 18,586 head, whilst variola is said to have caused 2,214 deaths and diseases not specified by name 25,356. The last figure is rather lower than that of the previous year, but a good deal above the average for the two earlier years for which statistics are available.

35. Taking all sorts of disease together, the parts of the Presidency which suffered most during the year were the Southern, excepting Salem; Tinnevelly, Tanjore and Madura coming off worst, whilst in the Northern districts Kurnool alone showed any considerable number of deaths. The districts which suffered most in proportion to the stock maintained are Ganjam, 21 per mille; Madura, 18; Chingleput, 16; Vizagapatam, 14; Kurnool, 14; Tanjore, 13; Nilgiris, 12; and Trichinopoly 10. Except in Ganjam, Vizagapatam and Kurnool, the greater part of this mortality was due to rinderpest.

The districts which reported the largest losses from rinderpest (including diarrhœa and dysentery) are Tanjore, Madura and South Arcot, in each of which the loss exceeded 6,000; Trichinopoly nearly that number; Chingleput and Coimbatore about 3,500 each; and North Arcot, Cuddapah and Kurnool from 2,500 to 2,800 deaths. Several districts almost escaped loss from this cause; this being specially noticeable in the West Coast districts, Tinnevelly, Salem, Anantapur, Bellary, Nellore and the Northern Circars. Altogether the losses were very much less widespread than in the preceding years as will be seen by reference to the second diagram in the appendix. It is peculiar that Salem and Nellore should have escaped loss to so great an extent, but, as already noted, the reporting from these districts has not been satisfactory. The comparatively small number of deaths reported from the two northern districts is attributable to the comparatively small area of the Government villages in them.

The districts which have usually reported the largest number of deaths from diseases other than rinderpest are Kurnool and North Arcot, over 7,000 each; Chingleput over 5,000, and Kistna about 4,800 on the average for three years; whilst Cuddapah, Nellore, South Arcot, Ganjam have all reported upwards of 2,500 deaths from these causes. During the past year Kurnool still remains first with 6,536 such deaths, but Madura shows 5,474 and Cuddapah 4,110, whilst Ganjam, North Arcot, Chingleput, South Arcot, Tanjore and Coimbatore all show upwards of 3,000.

In Ganjam, foot-and-mouth disease caused a large and anthrax a considerable number of deaths; in Vizagapatam, variola, anthrax and unspecified diseases nearly equal numbers, and in Kurnool unspecified diseases accounted for the bulk of the deaths. Anthrax also caused a considerable number of deaths in South Arcot, Chingleput and Cuddapah. Foot-and-mouth disease carried off a considerable number in Trichinopoly, Tanjore and Madura, whilst of the deaths attributed to variola, Kistna, Cuddapah, Madura, Coimbatore and Salem accounted for the bulk of the total appearing under that heading.

36. Snake-bites are said to have caused 2,698 deaths amongst cattle during the year, which is 197 less than in the preceding and 263 more than the average of the three previous years. The greatest number of deaths attributed to this cause were reported from Chingleput (454) and North Arcot (307), South Arcot (243) and Kistna (222). Wild animals caused 10,533 deaths or 1,324 more than the average of the three previous years and 16 more than were reported in 1889–90. Malabar (3,196) and South Canara (2,322) account for by far the greatest number of deaths caused in this way. Though wild beasts are reported to have caused some deaths in all districts, in Chingleput, Tanjore (11), Trichinopoly and Tinnevelly they destroyed less than 50 animals, in Vizagapatam 57 and Ganjam 88, whilst in South Arcot, Nellore, Anantapur and Bellary, the number did not exceed 162 in any case. These figures do not include deaths caused by wild animals in zemindaris, &c., but still the numbers reported in the case of almost all districts exceed those shown in the returns submitted by the Police.

37. The deaths of cattle attributed to criminal poisoning numbered only 24, against an average of 48 for the three previous years. The information received regarding these cases is as follows :—Kistna, 2 cases, in both of which the suspected person was discharged for want of evidence. Anantapur, 3 cases, in two of which the culprits were not traced, and in the third it is not yet known whether the Chemical Examiner has detected poison in the viscera which were forwarded to him. Coimbatore, 10 cases, two of which are still under inquiry; in two the accused were acquitted; in three, the accused were discharged for want of evidence; and in the other three, two of the offenders were sentenced to 2 months and one to 4 months' rigorous imprisonment, respectively. In Trichinopoly, one case, it is reported that as the animal poisoned was valued at less than Rs. 7, the offence was non-cognizable. In the Tanjore case, the accused was discharged. In Madura, 4 cases, in one case the culprit was not traced, and the accused in three others were discharged. In Tinnevelly, 3 cases, the culprits concerned were sentenced to 1 month's rigorous imprisonment each.

38. The mortality amongst sheep and goats from disease was nearly 10,000 less than in the previous year, and as usual the most fatal disease was variola or sheep-pox. This disease was particularly destructive in Anantapur, whilst it carried off considerable numbers also in the adjoining districts of Cuddapah and Bellary. In the last-named district, anthrax is also reported to have caused a large number of deaths, as did diarrhœa and dysentery in Cuddapah. Besides these districts, Madura alone reported a very large mortality amongst this description of stock, chiefly from rinderpest, diarrhœa and dysentery and sheep-pox. Wild animals appear to have been most destructive of this stock in Kistna, Kurnool, Anantapur, Cuddapah, Salem and Coimbatore. The total number killed in the Presidency amounted to 7,921. The losses from snake-bites were everywhere small, only numbering 192 reported cases. No cases of criminal poisoning of sheep and goats were reported during the year.

39. The number of deaths of horses and ponies reported during the year again showed a considerable increase which was most marked under the heads of diarrhœa, dysentery and anthrax.

VII. Miscellaneous.

40. *Crop Statistics.*—During the year the usual reports and forecasts of outturn on the four crops selected by the Government of India, viz., paddy, cotton, indigo and gingelly, were issued at the prescribed intervals. Representations were made during the year with a view to the better adjustment of the dates originally fixed upon for these reports to the circumstances of the Presidency with the result that the recommendations made in the case of paddy and indigo have been adopted for future guidance, but in the case of cotton, it was not considered advisable to make any alteration on account of the necessity for issuing general reports for the whole of India; in the case of gingelly the proposals made were accepted in part only. The alterations made will, it is hoped, allow of more useful forecasts being published in future.

41. The following statement shows the areas of the principal crops harvested in the Presidency during 1890–91 in comparison with the corresponding areas in the previous year. The figures relate almost entirely to Government villages.

Crops.	1889-90, Area harvested.	1890-91. Area Sown.	1890-91. Area Harvested.	1890-91. Outturn per cent. of average.
Food-grains.	ACS.	ACS.	ACS.	
Paddy	5,829,119	5,863,371	5,808,039	62
Cholum	4,106,362	4,323,932	4,294,417	57
Cumbu	2,504,075	2,661,104	2,659,468	51
Ragi	1,501,945	1,581,771	1,567,064	57
Others, including pulses	*	4,801,611	*	
Total of Food-grains		19,231,789		
Industrial crops.				
Sugar-cane	54,810	55,885	54,947	82
Cotton	1,548,691	1,676,908	1,655,586	55
Indigo	419,903	249,881	238,214	53
Castor	751,956	821,609	816,485	51
Gingelly	732,247	732,987	713,637	45
Ground-nut	271,057	250,992	248,016	55
Tobacco	96,921	89,193	87,324	60
All others, including topes	*	1,225,861	*	
Total Area		5,103,316		

* Not reported on.

Of the total cropped area, amounting to 24·3 million acres, nearly 80 per cent. was occupied by food-grains, including pulses, &c., and 14·3 per cent. by cotton and oil-seeds. Of the food-grains, paddy occupies the largest area (5·9 million acres), cholum and cumbu coming next with 4·3 and 2·6 millions, respectively. The chief industrial crops, next to cotton and oil-seeds, are indigo, tobacco and sugar-cane, which, respectively, cover 249,000, 89,000 and 55,000 acres. The outturn of food-crops varied during the year from 62 per cent. of an average crop for paddy to 51 per cent. for cumbu, and that of the industrial crops was generally between 51 and 60 per cent., except for sugar-cane and gingelly, which are, respectively, reported to have yielded 82 and 45 per cent. of an average crop. The following statement shows the distribution of the harvested area under the several crops in each district:—

Districts.	Percentage of harvested area under: Paddy.	Cholum.	Cumbu.	Ragi.	Cotton.	Indigo.	Sugar-cane.	Castor-oil and lamp-oil seeds.	Gingelly-oil seeds.	Ground-nut.	Tobacco.
1. Ganjam	4·5	·0	0·2	4·8	0·2	..	2·8	0·6	2·2	..	0·4
2. Vizagapatam	1·7	0·1	1·0	1·1	0·3	..	10·3	0·1	3·6	..	1·6
3. Godávarí	10·4	1·9	0·3	1·4	0·4	..	16·2	3·9	15·0	..	9·5
4. Kistna	7·8	9·8	7·1	1·8	11·5	20·3	0·1	14·8	0·2	..	20·3
5. Nellore	3·6	8·2	2·7	3·4	1·0	15·9	0·1	9·4	0·4	·0	3·0
6. Kurnool	1·3	14·2	3·0	1·8	16·0	16·4	1·8	15·7	0·8	..	11·8
7. Bellary	0·8	17·6	2·9	2·4	20·6	0·5	15·9	11·6	2·4	·0	5·6
8. Anantapur	1·4	6·0	1·7	4·3	8·6	1·9	3·1	10·7	2·4	·1	2·0
9. Cuddapah	1·1	8·9	9·3	9·9	9·0	15·8	9·1	13·1	0·7	·1	1·7
10. North Arcot	6·6	0·9	4·7	7·3	·0	4·7	9·0	2·6	9·3	12·1	0·4
11. Chingleput	6·5	0·3	0·6	3·6	..	5·8	0·2	·0	3·4	7·3	0·1
12. South Arcot	6·9	1·5	12·9	9·3	0·2	15·8	7·7	1·2	8·0	60·5	3·9
13. Salem	1·7	1·8	11·7	17·9	1·2	1·1	3·6	3·7	8·1	1·0	5·3
14. Coimbatore	1·6	17·2	22·8	12·7	15·5	..	8·9	5·3	13·6	·5	18·3
15. Trichinopoly	3·4	3·4	8·0	6·9	0·8	1·3	8·8	2·1	2·1	5·9	1·2
16. Tanjore	15·5	0·3	1·1	1·8	0·2	0·2	0·4	0·1	1·3	12·5	6·6
17. Madura	3·0	5·4	4·2	5·8	4·0	0·0	1·1	4·0	7·8	..	5·0
18. Tinnevelly	3·4	2·5	5·8	3·2	10·5	0·3	0·2	0·8	15·6	..	2·3
19. Nilgiris	0·1	·00	..	0·1	..	..	..	..	..	..	..
20. Malabar	10·5	..	..	0·3	..	..	..	0·2	2·5	..	..
21. South Canara	8·2	..	..	0·2	·0	..	0·7	0·1	0·6	..	1·0
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

42. *The Total Rail-borne Trade*—registered during the past year was the largest on record, as will be seen from the following statement:—

Year.	Imports.		Exports.		Internal.		Total.	
	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.
1885–86	2,272	233	1,993	189	24,000	1,260	28,265	1,682
1886–87	2,951	300	2,526	269	27,988	1,740	33,465	2,309
1887–88	3,486	350	2,957	286	20,997	1,600	27,440	2,236
1888–89	2,919	359	3,684	316	22,773	1,717	29,376	2,392
1889–90	3,783	393	4,311	372	23,752	1,915	31,846	2,680
1890–91	5,353	443	4,306	370	26,983	2,026	36,642	2,839

It amounted to 36,642,436 maunds, showing an advance of 4,796,310 maunds or 15 per cent. in quantity and Rs. 15,948,034 or 6 per cent. in value over the trade of the previous year. There was an increase of 1,570,789 maunds or 41·5 per cent. in quantity and Rs. 50,12,508 or about 13 per cent. in value in the imports from other provinces; of this, 932,216 maunds was contributed by Mysore and 627,500 maunds by the Nizam's territory. This increase was chiefly due to the unfavorable character of the season, which, causing diminished outturn for the crops in many districts, led to the importation of a million maunds of grain and pulse more than in the preceding year and over a million and-a-half maunds more than in either of the two years before that. There was a slight falling off both in the quantity and value of the exports to the other provinces. The decrease was principally caused by diminished exports to the Nizam's territory, which showed a decline of 296,834 maunds: the decreased exports of rice from Kistna more than accounts for this. The exports to Bombay and Mysore, however, increased and the total amount was far in excess of that of any of the earlier years. In the local trade there was an increase of 3,230,865 maunds or 13·6 per cent. More than a third of this increase consisted of railway plant and rolling stock, the traffic in which was not exhibited in the previous year's returns. Excluding that, the increase was 2,041,634 maunds or 8·6 per cent., nearly one-third of which consisted of stone and lime, more than one half of miscellaneous articles and about one-fifth of metals and coal and coke.

43. The following abstract shows how the external and internal trade of the past year of both the chief sea-port towns and the rest of the Presidency compare with that of the previous year:—

	For the year		Increase or Decrease.	
	1889–90.	1890–91.	Amount.	Percentage.
External trade.	I. MDS.	I. MDS.	I. MDS.	
Imports .. Into Madras (excluding chief sea-port towns)	2,604,709	4,039,814	+ 1,435,105	+ 55·0
Imports .. Into Madras chief sea-port towns ..	1,177,931	1,313,615	+ 135,684	+ 11·5
Total ..	3,782,640	5,353,429	+ 1,570,789	+ 41·5
Export .. From Madras (excluding chief sea-port towns)	3,072,306	2,877,271	— 195,035	— 5·3
Export .. From Madras chief sea-port towns ..	1,239,159	1,428,850	+ 189,691	+ 15·3
Total ..	4,311,465	4,306,121	— 5,344	— ·1
Internal trade.				
Of Madras excluding chief sea-port towns	10,855,693	14,043,806	+ 3,188,113	+ 29·3
Of Madras chief sea-port towns	12,896,328	12,939,080	+ 42,752	+ ·3
Total ..	23,752,021	26,982,886	+ 3,230,865	+ 13·6
Grand Total ..	31,846,126	36,642,436	+ 4,796,310	+ 15·1

It will be seen that the distribution of the increase or decrease is very different as between the sea-ports and the rest of the Presidency. Influenced by the preponderance of the grain trade, the increased imports went chiefly to the latter portion; whilst as to the exports, the sea-ports sent away 15 per cent. more than in the previous year, a fact which may be chiefly attributed to the larger exports of coal and coke from Madras to Mysore (120,000 Indian maunds) and to the larger exports of iron to the same province, so that excluding these two classes of goods there was in reality a decrease in the exports from the sea-ports as well as from the rest of the Presidency.

44. The distribution of the trade carried on amongst each of the blocks into which this Presidency is divided is shown in the following table both for the foreign or external and for the local or internal trade:—

Blocks.	Imports.								
	1889–90.				1890–91.				Percentage of increase or decrease.
	Foreign.	Internal.	Total		Foreign.	Internal.	Total		
			Amount.	Percentage.			Amount.	Percentage.	
1	2	3	4	5	6	7	8	9	10
	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
Madras port	1,071,968	7,447,628	8,519,596	30·9	1,189,807	8,124,691	9,314,498	28·8	+ 9·3
Pondicherry port ..	48,026	1,777,826	1,825,852	6·7	23,401	1,502,196	1,525,597	4·7	— 16·5
Negapatam port ..	17,461	1,322,244	1,339,705	4·9	24,744	1,458,486	1,483,230	4·6	+ 10·7
Tuticorin port	9,596	1,384,882	1,394,478	5·0	10,384	1,128,210	1,138,594	3·5	— 18·4
Calicut port	30,880	963,748	994,628	3·6	65,279	725,497	790,776	2·4	— 27·2
Ceded Districts and Kurnool	712,234	832,413	1,544,647	5·6	764,929	1,374,829	2,138,858	6·6	+ 38·6
Nellore	2,136	145,731	147,867	·5	23,918	223,077	246,995	·8	+ 70·8
Chingleput and North Arcot	461,213	1,871,945	2,333,158	8·4	542,898	2,322,738	2,865,636	8·9	+ 22·8
South Arcot, Tanjore and Trichinopoly ..	169,369	3,040,145	3,209,514	11·7	232,557	3,608,033	3,840,590	11·9	+ 19·7
Madura and Tinnevelly.	96,434	2,452,040	2,548,474	9·3	375,754	3,823,887	4,199,641	13·0	+ 65·0
Salem, Coimbatore and Malabar	1,015,082	2,485,624	3,500,706	12·8	1,541,053	2,535,516	4,076,569	12·6	+ 16·4
Kistna	148,241	27,795	176,036	·6	559,605	155,726	715,331	2·2	+ 306·3
Total ..	3,782,640	23,752,021	27,534,661	100·0	5,353,429	26,982,886	32,336,315	100·0	+ 17·4

Blocks.	Exports.								
	1889–90.				1890–91.				Percentage of increase or decrease of
	Foreign.	Internal.	Total		Foreign.	Internal.	Total		
			Amount.	Percentage.			Amount.	Percentage.	
	11	12	13	14	15	16	17	18	19
	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
Madras port. ..	1,167,360	3,238,029	4,405,389	15·7	1,370,492	4,209,358	5,579,850	17·8	+ 26·7
Pondicherry port ..	9,383	166,492	175,875	·6	2,085	171,015	173,106	·6	— 1·5
Negapatam port ..	1,677	1,031,144	1,032,821	3·7	4,632	1,168,451	1,173,083	3·8	+ 13·6
Tuticorin port ..	175	966,550	966,725	3·5	412	1,322,061	1,322,473	4·2	+ 37·0
Calicut port ..	60,564	511,249	571,813	2·0	51,229	690,501	741,730	2·4	+ 29·8
Ceded Districts and Kurnool	567,633	1,650,201	2,217,834	7·9	628,876	1,989,768	2,618,644	8·4	+ 18·1
Nellore	2,276	261,137	263,413	1·0	1,359	455,869	457,228	1·5	+ 74·5
Chingleput and North Arcot ..	652,269	6,685,042	7,337,311	26·1	688,489	7,400,614	8,089,103	25·9	+ 10·2
South Arcot, Tanjore and Trichinopoly ..	59,232	4,638,946	4,698,178	16·7	51,215	5,266,023	5,317,238	17·0	+ 13·2
Madura and Tinnevelly	4,122	1,925,415	1,929,537	6·9	6,825	1,703,862	1,710,687	5·5	— 11·3
Salem, Coimbatore and Malabar ..	1,097,820	2,645,324	3,743,144	13·3	1,105,229	2,484,681	3,589,910	11·2	— 4·1
Kistna	688,954	32,492	721,446	2·6	395,278	120,683	515,961	1·7	— 28·5
Total ..	4,311,465	23,752,021	28,063,486	100·0	4,306,121	26,982,886	31,289,007	100·0	+ 11·5

The enormous increase in the imports of Kistna is attributable to development of the trade in coal from Singareni and to large imports of castor seeds. The decrease in the exports is more than accounted for by smaller exports of rice to Hyderabad. The large proportionate increase in the imports into Nellore was due to the demand for food-grains. The corresponding increase in the exports consisted chiefly of salt and miscellaneous articles. The enormous development of the imports into Madura and Tinnevelly is to be attributed also to the great demand for food-grains. At the same time, the same alteration in the trade caused a decrease in the imports to Calicut and Tuticorin, in the latter case being aided by the smaller quantities of raw sugar sent to that port. The increased exports from the last-named port consisted chiefly of salt, coal and coke, iron, raw sugar and food-grains. The increased exports from Calicut also consisted largely of salt and food-grains. The increased imports to the Ceded Districts and Kurnool consisted chiefly of coal and coke, railway plant, rice and salt from Bombay; the increased exports consisted chiefly of food-grains sent to other parts of the Presidency. The increased imports into Chingleput and North Arcot consisted very largely of food-grains and the exports of raw sugar and ground-nuts. The larger exports from Madras consisted chiefly of coal and coke and railway plant.

45. *Road Traffic—Inter-provincial.*—The traffic with the Central Provinces was registered at two stations in the Vizagapatam district. The principal articles of import from those provinces were oil-seeds, grains and pulses, raw cotton and hides; the principal articles exported were salt and tobacco. The following statement shows the extent of inward and outward traffic registered at each station on account of goods, passengers and animals :—

Stations.	Inwards.			Outwards.		
	Goods.	Passengers.	Animals.	Goods.	Passengers.	Animals.
	I. MDS.	NO.	NO.	I. MDS.	NO.	NO.
Bissemcuttack	194,958	2,301	463	67,130	2,288	181
Rayaghada	383,047	15,142	60	120,839	12,117	1,622

The trade from Vizagapatam to Jeypore was also registered at Pottanghi on three routes. It amounted to 445,079 maunds and 1,705 animals upwards from the plains and 567,877 maunds and 72 animals towards the coast. Salt accounted for the bulk of the former traffic, with twist and piece-goods and tobacco also in large quantities. The downward traffic consisted chiefly of food-grains, oil-seeds and myrabolans.

46. *Internal Trade.*—The local trade was registered at 25 stations in eight districts on thirteen roads as noted in the margin.

	Roads.	Stations.
Ganjam	2	5
Vizagapatam	2	4
Kistna	3	4
Nellore	1	2
South Arcot	2	5
Tanjore	1	1
Madura and Tinnevelly ...	2	4

In *Ganjam*, the traffic was registered at Russelkonda, Purushottapur and Iyenjelli, which are situated on what are called the "Aska roads," and at Varanasi and Hiramandalam on the road from Battili to Calingapatam. The following is an abstract of the long distance traffic registered at each station in goods, passengers and animals :—

Stations.	Goods.	Passengers.	Animals.
	I. MDS.	NO.	NO.
Russelkonda	372,359	44,792	16,981
Purushottapur	324,722	27,448	2,162
Iyenjelli	619,540	89,757	14,109
Hiramandalam	1,079,968	599,084	7,917
Varanasi	1,293,922	78,138	356

The principal articles of trade were turmeric, oil-seeds, hides and refined sugar towards the coast, and salt, provisions, food-grains, raw sugar, piece-goods, and twist towards Aska.

In *Vizagapatam*, the roads from Vizianagram to Pálkonda and from Vizianagram to Párvatipur were taken up for registration. The traffic on the former road was registered at Rajam and Pálkonda and that on the latter at Ramabhadrapuram and Párvatipur. The amount of the long distance traffic registered at each station is given below :—

Stations.	Goods.	Passengers.	Animals.
	I. MDS.	NO.	NO.
Rajam	338,260	86,059	3,839
Pálkonda	655,098	136,357	8,023
Ramabhadrapuram	1,106,673	58,643	3,087
Párvatipur	537,101	49,530	591

The principal articles of commerce were grains, oil-seeds and salt.

In *Kistna and Nellore*, the traffic on the road from Guntúr to the Hyderabad Frontier was registered at Piduguralla, that from Guntúr to Kurnool district *viâ* Dupad at Vinukonda, and that on the great northern trunk road from Nellore to Godávari at Guntúr, Chilakalurpet and Velampalle, the last-named station being within the limits of the Nellore district. The traffic on the latter road was also registered at Somayajapalle, where the road from Ongole to Cumbum joins it. The traffic which passed from the Hyderabad Frontier towards Guntúr and Ongole consisted chiefly of stone and lime, raw cotton, castor-seeds and pulses, and that towards Hyderabad of salt, rice and paddy, raw sugar and provisions. The trade between Kistna and Kurnool, registered at Vinukonda, was principally in stone and lime, salt and manufactured tobacco. In the opposite direction the trade was smaller, but included a considerable amount of salt also. That registered at Somayajapalle was chiefly in salt and paddy sent to Cumbum and in cholum, dyes and tans and ghee received in exchange. The principal articles of trade passing on the trunk road were :—*At Guntúr*, northwards, twist, castor-seeds, gram, ghee, tobacco, wheat and chillies, and southwards, cholum, raw sugar and turmeric. *At Chilakalurpet*, northwards, salt, castor-seeds and tobacco, and southwards, cholum, paddy, pulses and indigo. *At Velampalle*, northwards, cholum, provisions, iron and salt, and, southwards, castor-seeds, chillies and tobacco and gram. *At Somayajapalle*, northwards, paddy, cholum, provisions and raw sugar, and southwards, tobacco, chillies and castor-seeds. The following is an abstract statement of the traffic registered at these stations :—

Stations.	Goods.	Passengers.	Animals.	Goods.	Passengers.	Animals.
	I. MDS.	NO.	NO.	I. MDS.	NO.	NO.
	Towards Hyderabad.			*From Hyderabad.*		
Piduguralla	373,398	15,349	38	350,008	14,295	1,479
Guntúr	328,997	12	..	862,177	305	30
	Towards Kurnool.			*From Kurnool.*		
Vinukonda	40,295	11,276	2,704	28,667	7,650	361
Somayajapalle	131,378	10,474	..	53,582	10,864	101
	On the Trunk Road.					
	Northwards.			*Southwards.*		
Guntúr	690,940	258	..	81,633	508	690
Chilakalurpet	92,565	22,654	2,406	96,404	22,890	1,928
Velampalle	75,241	15,582	40	141,654	18,308	27
Somayajapalle	89,057	30,548	208	73,082	31,862	25,014

In *South Arcot*, the trade on the road from Tiruvannámalai to Cuddalore was registered at Tiruvannámalai and Tirukoilúr, and that from Cuddalore to Salem at Vriddháchalam, Veppur and Rayappanur. Paddy, cholum and tobacco were the articles principally received from the Tiruvannámalai direction and the articles carried

towards that place were chiefly of provisions and spirits. The trade from the Cuddalore direction registered at Tirukoilúr principally consisted of salt and oil-seeds, and that carried in the contrary direction of paddy, rice, ground-nuts and tobacco; and on the Salem road salt was the principal article carried inland from Cuddalore; but considerable quantities of paddy were also carried and the return traffic towards that place chiefly consisted of grains, ground-nuts, raw cotton, tobacco and chillies. At Veppur and Tirukoilúr the cross traffic was also registered. The following is an abstract of the whole:—

Stations.	Goods.	Passengers.	Animals.	Goods.	Passengers.	Animals.
	I. MDS.	NO.	NO.	I. MDS.	NO.	NO.
	From Cuddalore.			*Towards Cuddalore.*		
Tiruvannámalai	13,653	7,669	2,454	54,435	9,177	1,560
Tirukoilúr	29,002	15,671	..	97,512	16,936	13,926
Vriddháchalam	271,607	64,911	12,471	474,019	62,825	1,179
Rayappanur	89,067	55,166	358	139,419	52,348	3,945
Veppur	29,339	25,747	..	67,862	24,804	677
	Northwards.			*Southwards.*		
Veppur	100,203	25,158	1,414	75,205	25,539	9,354
Tirukoilúr	8,866	20,958	30	16,696	12,951	13,018

In *Tanjore*, the trade passing from Nidámangalam towards Adirámpatnam was registered at Mannárgudi where a road branches off to Patukóta, but the statistics have been rejected as being inaccurately reported.

In *Madura and Tinnevelly*, two roads were taken up for the registration of traffic, one leading from Madura to Tinnevelly *viâ* Srívilliputur and the other from Tinnevelly to Trivandrum. The stations at which the traffic was registered on account of the former road were Tirumangalam, Rajapalaiyam and Sankaranainárkoil. The traffic on the latter road was registered at Panakudi. The traffic which passed from Periyakulam, Sholavandan and Madura towards Tinnevelly and *vice versâ*, *viâ* Tirumangalam was registered at the last-named station. At Rájapalaiyam, the traffic which passed from Madura to Tinnevelly and Tenkási and that from Periyakulam to Rajapalaiyam and *vice versâ* were registered, and at Sankaranainárkoil the traffic passing on the main road as well as that on the branch road leading to Kalugumalai were registered. The following table gives the total traffic registered:—

Stations.	Goods.	Passengers.	Animals.	Goods.	Passengers.	Animals.	Chief articles of trade.
	I. MDS.	NO.	NO.	I. MDS.	NO.	NO.	
	Towards Tinnevelly.			*From Tinnevelly.*			
Tirumangalam	143,519	9,042	3,434	35,337	10,734	1,383	Towards Tinnevelly.—Grains, raw cotton, provisions, stone and lime. From Tinnevelly.—Raw sugar and provisions.
Rajapalaiyam	163,597	72,359	5,628	263,686	77,464	867	Towards Tinnevelly.—Grains, provisions and tobacco. From Tinnevelly.—Salt, paddy, raw sugar, oil-seeds, coal and coke.
Sankaranainárkoil	101,110	32,224	489	124,822	37,258	39	Towards Tinnevelly.—Grains, oil-seeds, cotton, raw, and chillies. From Tinnevelly.—Salt, iron, paddy and pulses.
	Eastwards.			*Westwards.*			
Tirumangalam	9,946	4,129	29	25,104	4,233	22	Towards the East.—Paddy and pulses, coal and coke, raw cotton and chillies. Towards the West.—Paddy and pulses, stone and lime.
Sankaranainárkoil	180,189	26,861	789	121,832	24,339	3,015	
	Towards Travancore.			*From Travancore.*			
Panakudi	286,294	126,980	12,850	706,099	130,280	1,869	Towards Travancore.—Rice and paddy, spices and tobacco. From Travancore.—Raw sugar, provisions, cocoanut-oil and castor-oil.

APPENDIX I.

From C. BENSON, Esq., Assistant Director of Agriculture in charge of the office of the Inspector of Cattle Diseases, Madras Presidency, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated 11th June 1891, No. 255.

I have the honour to submit the following report on cattle disease operations during the past official year.

2. From 9th April to 8th June 1890 Mr. Hazelton was on privilege leave and on 25th July soon after his return he resigned the appointment, and it was not again filled up. In G.O., No. 515, dated 4th July 1890, the abolition of the post was proposed, but in G.O., No. 236, dated 23rd March 1891, it was resolved to continue it, but no officer has yet been appointed to the post. Owing to this the operations were circumscribed.

3. At the beginning of the year the Sub-Assistant Director of Agriculture was on privilege leave from which he returned on 24th May. During June and July he was engaged in inspecting the work of the Stock Inspectors in Nellore, after that he was called into the Board's Office for duty there during the absence of the Assistant Director of Land Records and Agriculture on leave, and remained at head-quarters till the end of the year.

4. Under G.O., No. 515, dated 4th July 1890 three months' notice was given to all Stock Inspectors that their services would be dispensed with on the receipt of the sanction of the Government of India to the abolition of the appointment of Inspector of Cattle Diseases. In consequence of this notice four Inspectors left the department and obtained other appointments. Of the remaining fourteen Inspectors, six were selected in January last to undergo a special course of training at Saidápet with a view to their being better fitted to take charge of the Veterinary Hospitals, sanctioned in the Government Order above quoted. They remained on this duty till the end of the year. In March last, three Inspectors were placed on special duty in connection with famine relief work.

5. The actual cattle disease work done by the Inspectors is shown in the tables annexed, which also show the amount of medicines distributed and the expenditure incurred. The Deputy Inspector of Cattle Diseases was in charge of pony-breeding operations throughout the year, although his pay and allowances are included in the statement.

6. Act II of 1866 was put in force at the Subramania Cattle Fair in South Canara and at the Chitrai Fair at Madura during the year, and its provisions were enforced by Stock Inspectors detailed for the duty. The Act was withdrawn from all districts under the G.O., No. 984, dated 4th December 1890 and the Government, in its orders of July last, resolved to abandon all operations for directly combating disease except at fairs and festivals.

During an outbreak of rinderpest amongst the conservancy bullocks of the Madras Municipality, the work done by the Stock Inspectors detailed to deal with the disease was as follows :—

Number of animals.			
Treated.	Recovered.	Died.	Remaining.
134	54	56	24

The results were on the whole favorable.

7. The service books of the establishment have been brought up to date and verified.

Enclosure No. 1.

Table showing the sick animals treated by Stock Inspectors during the official year 1890–91.

Names.	Number of villages inspected.		Number of sick animals.				Remarks.	M.	D.
	Inspected.	Non-inspected.	Admitted for treatment.	Recovered.	Died.	Unknown.			
1. P. Raghava Pillai	50	88	297	42	29	226	On privilege leave	1	0
							On other duty	3	0
2. K. Padmanabhaya	53	65	172	85	45	42	On privilege leave	1	0
							On sick leave	3	21
3. M. Venketramana Sastry ..	73	45	110	75	12	23	On privilege leave	2	10
							On other duty	0	11
4. A. Canthayya Mudaliar ..	68	54	250	69	45	136	On sick leave	4	0
5. B. K. Santaya	93	126	723	401	24	298	On privilege leave	1	0
							On other duty	2	0
6. M. Kuppoosawmy Sastry ..	37	68	15	8	3	4	On privilege leave	1	28
							Left the department, 1st November 1890.	..	
7. K. Sethu Row	126	34	84	49	20	15	On privilege leave	1	20
							On other duty	2	11
8. P. Viswanatha Iyer	41	153	138	51	25	62	Leave on loss of pay	0	10
9. V. P. Subramania Mudaliar.	18	189	139	88	8	43	On privilege leave	2	22
							On other duty	2	9
10. K. Ramen	18	38	37	16	11	10	On privilege leave	1	18
							Left the department, 1st September 1890	..	
11. R. Narayana Row	50	7	315	147	77	91	On privilege leave	1	0
							Left the department, 30th October 1890	5	2
12. Seethambu Devoo	107	134	106	69	23	14	Leave on loss of pay	2	0
							On other duty	0	20
13. G. Rungiah Naidu	104	82	281	124	64	93	Leave on loss of pay	0	15
							On other duty	1	10
14. M. Hassen Ali	43	109	173	31	28	114	Privilege leave	1	0
							On other duty	2	17
15. S. Subramania Iyer	5	134	16	7	..	9	Privilege leave	2	1
							Left the department, 19th September 1890	..	
16. V. Chockalingam Pillai ..	65	244	169	13	7	149	On other duty	0	21
17. R. Kanniah Naidu	256	95	937	470	28	439	Leave on medical certificate ..	1	0
							On other duty	0	13
18. Moses Abraham	112	119	454	65	47	342	Leave on loss of pay	1	14
							On other duty	2	14
Total ..	1,319	1,784	4,416	1,810	496	2,110			

Abstract of cases treated under different diseases and results.

Rinderpest	2,669	905	414	1,350
Diarrhœa and dysentery ..	78	56	1	21
Anthrax	172	62	42	68
Epizootic aphtha	1,126	577	1	548
Variola (sheep-pox)	124	59	25	40
Other diseases	247	151	13	83
Total ..	4,416	1,810	496	2,110

ENCLOSURE No. 2.

STATEMENT showing the number of villages inspected by the Stock Inspectors in each taluk of the district in which they were posted for duty during the official year 1890–91.

1		2		3		4		5		6	
P. Raghava Pillai.		K. Padmanabhaya.		M. Venketramana Sastry.		A. Canthayya Mudaliar.		B. K. Santaya.		M. Kuppoosawmy Sastry.	
Nellore, Madras, North Arcot and Tanjore.		Cuddapah.		Madura and Kurnool.		Madura.		South Canara.		Kistna.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
Nellore District.				*Madura District.*							
Kandukúr	129	Sidhout	2	Tirumangalam ..	5	Madura	22	Mangalore	119	Bandar	21
		Badvél	7	Madura	5	Malore	19	Uppinangadi ..	35	Répalle	20
Madras.		Pulivendla	11	Dindigul	4	Dindigul	57	Udipi	42	Guntúr	9
		Proddutúr	4			Palni	19	Coondapoor ..	10	Bezváda	11
Monegar Choultry Bullock Depôt ..	1	Rayachóti	11	*Kurnool.*		Tirumangalam ..	5	Kásaragód	13	Gudiváda	16
		Váyalpád	1							Narsáraopet ..	11
North Arcot.		Madanapalle	44	Kurnool	1					Palnád	13
		Cuddapah	20	Koilkuntla	31					Sattenapalle ..	1
		Pullampet	18	Rámallakót	39					Vinukonda ..	3
Chittoor	5			Márkápur	21						
				Sírvel	1						
Tanjore.				Nandyál	1						
				Pattikonda	10						
Kumbakónam ..	3										
Total ..	138		118		118		122		219		105

Statement showing the number of villages inspected by the Stock Inspectors in each taluk of the district, &c.—*cont.*

7		8		9		10		11		12	
K. Sethu Row.		C. Viswanatha Iyer.		V. P. Subramoney Mudali.		K. Ramen.		R. Narayana Row.		V. Seethambu Devoo.	
South Arcot and Tanjore.		Anantapur.		Tinnevelly.		Malabar.		South Arcot and Trichinopoly.		Kistna.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
South Arcot District.								*South Arcot District.*			
Tirukoilúr	62	Anantapur	55	Tinnevelly	25	Kurumbranád ..	13	Tirukoilúr	1	Palnád	84
Cuddalore	37	Tadpatri	16	Otapidáram	13	Kóttayam	5			Répalle	21
Chidambaram ..	21	Gooty	48	Sátúr	67	Calicut	16	*Trichinopoly District.*		Bápatla	77
Tindivanam	2	Dharmavaram ..	13	Sankaranainárkoil ..	21	Pónáni	3			Guntúr	15
Tiruvannámalai ..	3	Penukonda	11	Srívilliputur	13	Wálwanád ..	5			Bezváda	2
		Hindupur	50	Tenkarai	12	Ernád	14	Musiri	32	Narsaraopet ..	25
Tanjore District.		Madakasíra	1	Tenkási	18			Udayárpálaiyam ..	22	Sattenapalle ..	1
				Ambásamudram ..	19			Perambalúr ..	2	Gudiváda	16
Tanjore	8			Nángunéri	19						
Kumbakónam ..	16										
Negapatam	5										
Nannilam	6										
Total ..	160		194		207		56		57		241

*Statement showing the number of villages inspected by the Stock Inspectors in each taluk of the district, &c.—*cont.*

13		14		15		16		17		18	
G. Rungiah Naidu.		M. Hassen Ali.		B. Subramoney Iyer.		V. Chockalingam Pillai.		R. Kanniah Naidu.		Moses Abraham.	
Kurnool, North Arcot, Chingleput and Madras.		Salem.		Bellary.		Nellore.		Godávari.		Tanjore.	
Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.	Taluks.	Number of villages visited.
Kurnool District.											
Márkápur	6	Uttankarai	43	Bellary	88	Nellore	206	Peddápuram ..	32	Tanjore	57
		Salem	69	Hospet	43	Gúdúr	49	Rámachandrapuram	54	Kumbakónam ..	62
North Arcot District.		Tirupatúr	22	Alúr	3	Pólúr	7	Cocanada	147	Nannilam	102
		Tiruchengód	5	Ráyadrug	5	Rápúr	13	Pithápuram ..	12	Negapatam ..	10
Punganúr	11	Atúr	13			Atmakúr	9	Amalápuram ..	5		
Kálahasti	7					Ongole	23	Narsápur	15		
						Kandukúr	1	Rajahmundry ..	26		
Chingleput District.						Kávali	1	Tuni	10		
								Ellore	25		
Saidápet	53							Tanuku	25		
Chingleput	12										
Madurántakam ..	8										
Ponnéri	33										
Conjeeveram	40										
Tiruvallúr	15										
Madras.											
Monegar Choultry Bullock Depôt ..	1										
Total ..	186		152		139		309		351		231

ENCLOSURE No. 3.

STATEMENT showing the number of doses of medicines despatched to the undermentioned districts during the official year 1890–91.

Districts.	Astringent powder for rinderpest, 2nd stage.	Carbolic balls for anthrax and rinderpest, 1st stage.	For foot-and-mouth disease, for external application.	For foot-and-mouth disease to make gargle.	Cinchona febrifuge.	Disinfectants.	
						MacDougall's powder.	Roll sulphur.
	DOSES.	DOSES.	LB.	LB.	LB.	CWT. LB.	CWT. LB.
Anantapur	500	520	..	..	..	..	..
Canara, South	4,000	2,000	..	6	2	1 0	..
Chingleput	..	500	..	..	..	1 0	0 10
Ganjam	500	600	10	10	..	..	..
Madras	100	100	..	..	..	0 30	..
Nilgiris	50	100	5	5	..	0 30	1 0
Trichinopoly	..	600	..	..	..	0 30	..
Total ..	5,150	4,420	15	21	2	2 90	1 10

STATEMENT showing the actual charges incurred during the official year 1890–91 :—

	Rs.	A.	P.
Pay and allowances—			
Inspector of Cattle Diseases	3,392	12	0
Deputy Inspector of Cattle Diseases	4,517	0	0
Sub-Assistant Director of Agriculture	2,835	6	0
Stock Inspectors	16,751	7	5
Office establishment	987	11	2
District medicines	135	15	2
Contingent charges	441	12	2
Total ...	29,061	15	11

APPENDIX II.

STATISTICS of mortality among cattle in the Presidency of Madras during the year 1890–91.

Districts.	Total stock for 1890–91.	Deaths due to disease.								Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.		Natural decay.	Accidents.	Snake-bites.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
								Number.	Rate per mille.								
1. Ganjam	233,100	649	835	841	1,810	..	801	4,936	21	478	3	39	88	..	608	5,544	24
2. Vizagapatam ..	125,300	105	469	305	115	467	353	1,814	14	829	38	18	57	..	942	2,756	22
3. Godávari	803,900	664	1,273	1,242	282	..	271	3,732	5	8,783	258	143	350	..	9,534	13,266	17
4. Kistna	1,151,300	354	417	1,008	42	299	1,324	3,444	3	18,830	1,095	222	339	2	20,488	23,932	21
5. Nellore	630,300	607	1,228	1,062	54	101	1,101	4,153	7	6,651	303	88	113	..	7,155	11,308	18
6. Kurnool	632,400	1,913	593	1,104	103	167	5,162	9,042	14	6,633	666	130	398	..	7,827	16,869	27
7. Bellary	655,000	24	56	287	16	11	1,641	2,035	3	7,672	580	35	162	..	8,449	10,484	16
8. Anantapur	602,600	640	266	635	113	..	945	2,599	4	6,698	456	35	139	3	7,331	9,930	16
9. Cuddapah	1,033,400	213	2,437	1,745	100	293	1,972	6,760	7	8,267	632	66	562	..	9,527	16,287	16
10. North Arcot	920,600	750	2,042	1,721	408	8	1,129	6,058	7	16,928	534	307	604	..	18,373	24,431	27
11. Chingleput	439,500	1,576	1,962	2,320	280	..	797	6,935	16	13,643	327	454	41	..	14,465	21,400	49
12. South Arcot	1,089,600	4,549	1,548	2,912	198	..	455	9,662	9	11,310	301	243	106	..	11,960	21,622	20
13. Salem	1,097,300	137	306	71	53	247	514	1,328	1	2,080	247	62	467	..	2,856	4,184	4
14. Coimbatore	1,300,200	408	3,033	246	350	206	2,473	6,716	5	10,957	663	121	711	10	12,462	19,178	15
15. Trichinopoly ..	637,700	762	3,927	428	600	78	813	6,608	10	14,221	510	152	47	1	14,931	21,539	34
16. Tanjore	881,100	5,694	2,307	1,280	556	3	1,344	11,184	13	13,476	257	169	11	1	13,914	25,098	28
17. Madura	649,800	1,691	4,408	940	678	241	3,615	11,573	18	12,202	517	126	289	4	13,138	24,711	38
18. Tinnevelly	489,900	135	276	76	25	80	247	839	2	6,516	93	69	45	3	6,726	7,565	15
19. Nilgiris	70,100	676	26	16	133	..	4	855	12	1,699	497	10	486	..	2,692	3,547	51
20. Malabar	936,600	248	470	118	38	10	213	1,097	1	14,077	286	161	2,322	..	16,846	17,943	19
21. South Canara ..	682,900	175	28	229	110	3	182	727	1	15,786	1,366	48	3,196	..	20,396	21,123	31
Total ..	15,062,600	21,970	27,907	18,586	6,064	2,214	25,356	102,097	6·8	197,736	9,629	2,698	10,533	24	220,620	322,717	21·4

Statistics of mortality among sheep and goats in the Presidency of Madras during the year 1890–91—*cont.*

Districts.	Total stock for 1890–91.	Deaths due to disease.								Deaths due to other causes					Total deaths from all causes.	
		Rinderpest.	Diarrhœa and Dysentery.	Anthrax.	Epizootic aphtha.	Variola (sheep pox, &c.).	All other diseases.	Total.		Natural decay.	Accidents.	Snake-bites.	Wild animals.	Total.	Number.	Rate per mille.
								Number.	Rate per mille.							
1. Ganjam	52,600	9	53	26	144	55	88	375	7	2	..	1	31	34	409	8
2. Vizagapatam	47,200	52	223	57	..	256	48	636	13	158	17	3	204	382	1,018	22
3. Godávari	149,800	15	..	16	186	94	2	313	2	261	18	4	69	352	665	4
4. Kistna	540,100	..	2	1	..	125	338	466	1	1,274	129	3	643	2,049	2,515	5
5. Nellore	570,700	12	20	13	..	..	429	474	1	1,532	139	2	260	1,933	2,407	4
6. Kurnool	586,800	49	57	151	..	104	668	1,029	2	349	322	10	847	1,528	2,557	4
7. Bellary	610,700	..	177	2,093	..	1,092	994	4,356	7	2,053	320	1	224	2,598	6,954	11
8. Anantapur	891,800	93	143	281	74	3,430	707	4,728	5	2,788	218	6	852	3,864	8,592	10
9. Cuddapah	1,342,800	45	1,523	801	20	1,144	747	4,280	3	2,042	166	11	1,384	3,603	7,883	6
10. North Arcot	712,800	130	124	433	38	97	403	1,225	2	2,021	127	3	284	2,435	3,660	5
11. Chingleput	269,500	37	122	189	63	159	166	736	3	1,860	47	23	197	2,127	2,863	1
12. South Arcot	987,700	413	439	152	17	13	300	1,334	1	1,307	57	2	28	1,394	2,728	3
13. Salem	1,210,700	34	37	..	17	41	75	204	..	677	93	11	673	1,454	1,658	1
14. Coimbatore	1,364,000	82	401	124	129	136	1,399	2,271	2	7,009	925	22	963	8,919	11,190	8
15. Trichinopoly	1,083,100	40	348	384	105	113	120	1,110	1	8,307	825	33	307	9,472	10,582	10
16. Tanjore	572,900	45	13	25	9	..	89	181	..	1,643	29	10	25	1,707	1,888	3
17. Madura	712,100	846	751	417	103	782	1,744	4,643	7	7,283	364	29	347	8,023	12,666	18
18. Tinnevelly	856,200	270	307	41	21	510	446	1,595	2	6,595	384	17	418	7,414	9,009	11
19. Nílgiris	8,100	..	..	..	..	..	..	..	..	8	2	..	27	37	37	5
20. Malabar	66,700	..	1	5	..	5	8	19	..	375	86	1	101	563	582	9
21. South Canara ..	10,400	..	..	2	..	..	..	2	..	62	10	..	37	109	111	11
Total ..	12,646,700	2,172	4,741	5,211	926	8,156	8,771	29,977	2·4	47,606	4,278	192	7,921	59,997	89,974	7·1

Statistics of mortality among horses and ponies in the Presidency of Madras during the year 1890–91—*cont.*

Districts.	Total stock for 1890-91.	Deaths due to disease.						Deaths due to other causes.					Total deaths from all causes.	
		Diarrhœa and dysentery.	Anthrax.	Variola.	All other diseases.	Total. Number.	Total. Rate per mille.	Natural decay.	Accidents.	Snake-bites.	Wild animals.	Total.	Number.	Rate per mille.
1. Ganjam	200	..	..	..	9	9	45	..	..	..	6	6	15	7
2. Vizagapatam	100	4	..	..	..	4	40	..	..	..	..	..	4	40
3. Godávari	2,000	..	..	..	..	..	..	30	2	..	1	33	33	16
4. Kistna	4,600	..	1	2	6	9	2	78	7	..	6	91	100	22
5. Nellore	1,100	..	..	..	2	2	2	44	2	..	3	49	51	46
6. Kurnool	3,400	1	3	..	43	47	14	65	11	..	35	111	158	46
7. Bellary	4,800	..	..	3	15	18	4	43	4	..	11	58	76	16
8. Anantapur	3,100	4	7	..	66	77	23	97	9	1	7	114	191	62
9. Cuddapah	1,900	1	2	..	1	4	2	18	5	1	12	36	40	21
10. North Arcot	2,400	1	1	..	1	3	1	32	3	..	1	36	39	16
11. Chingleput	900	..	1	..	7	8	9	25	3	1	..	29	37	41
12. South Arcot	3,000	..	..	..	1	1	..	19	2	..	..	21	22	7
13. Salem	3,600	1	..	..	..	1	..	8	..	..	7	15	16	4
14. Coimbatore	3,700	3	1	1	4	9	2	30	2	..	18	50	59	15
15. Trichinopoly	800	..	..	2	..	2	3	8	..	..	..	8	10	13
16. Tanjore	1,500	..	..	..	..	..	..	11	..	..	..	11	11	7
17. Madura	3,100	..	1	..	1	2	1	32	5	..	26	63	65	21
18. Tinnevelly	600	..	..	..	..	..	..	12	..	..	..	12	12	20
19. Nílgiris	1,500	..	..	..	1	1	1	8	8	..	9	25	26	17
20. Malabar	900	..	..	..	2	2	2	5	1	..	1	7	9	10
21. South Canara	200	..	..	..	..	..	..	9	..	..	1	10	10	50
Total ..	43,400	15	17	8	159	199	4·6	574	64	3	144	785	984	22·7

APPENDIX III.

MONTHLY Statistics of mortality among live stock in the Madras Presidency during the year 1890–91.

Months.	Number of deaths of cattle due to													Total number of deaths from all causes.
	Disease.							Other causes.						
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bite.	Poisoning.	Wild animals.	Total.	
April 1890	1,828	2,566	1,182	548	166	1,445	7,735	12,547	673	178	1	705	14,104	21,839
May ,,	1,963	2,454	903	375	120	1,424	7,239	14,301	577	197	..	697	15,772	23,011
June ,,	1,757	1,477	1,237	283	200	1,802	6,756	16,320	811	157	1	791	18,080	24,836
July ,,	2,026	1,906	1,431	497	165	1,807	7,832	18,685	1,035	252	1	953	20,926	28,758
August ,,	1,951	2,418	1,763	481	384	2,258	9,255	18,715	895	273	2	1,012	20,897	30,152
September ,,	2,010	2,333	2,225	391	127	2,474	9,560	16,010	753	276	1	1,012	18,052	27,612
October ,,	1,631	2,575	1,861	426	232	3,553	10,278	18,487	1,178	282	9	1,145	21,101	31,379
November ,,	1,710	2,086	2,174	561	217	2,391	9,139	17,289	715	279	2	989	19,274	28,413
December ,,	1,573	2,290	1,607	544	69	2,132	8,215	16,965	576	271	4	955	18,771	26,986
January 1891	2,089	2,217	1,409	687	277	1,992	8,671	17,257	722	207	1	907	19,094	27,765
February ,,	1,773	2,763	1,480	724	124	2,050	8,914	16,133	999	157	..	732	18,021	26,935
March ,,	1,659	2,822	1,314	547	133	2,028	8,503	15,027	695	169	2	635	16,528	25,031
Total ..	21,970	27,907	18,586	6,064	2,214	25,356	102,097	197,736	9,629	2,698	24	10,533	220,620	322,717

Months.	Number of deaths of sheep and goats due to												Total number of deaths from all causes.
	Disease.							Other causes.					
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bite.	Wild animals.	Total.	
April 1890	535	556	794	43	753	728	3,409	2,809	796	20	462	4,087	7,496
May ,,	140	140	125	42	512	469	1,428	2,842	266	15	559	3,682	5,110
June ,,	118	642	211	5	104	603	1,683	2,485	161	7	590	3,243	4,926
July ,,	97	112	250	38	257	342	1,096	2,970	168	29	801	3,968	5,064
August ,,	34	49	222	5	410	295	1,015	3,437	183	24	870	4,514	5,529
September ,,	82	190	260	17	467	527	1,543	3,434	84	16	789	4,323	5,866
October ,,	109	130	610	88	515	1,255	2,707	7,789	1,124	25	762	9,700	12,407
November ,,	157	237	334	207	247	876	2,058	5,798	402	20	723	6,943	9,001
December ,,	136	843	410	188	1,274	987	3,838	4,641	144	10	678	5,473	9,311
January 1891	52	440	730	158	1,276	1,140	3,796	3,915	176	10	642	4,743	8,539
February ,,	275	340	623	29	1,479	827	3,573	3,656	462	10	505	4,633	8,206
March ,,	437	1,062	642	106	862	722	3,831	3,830	312	6	540	4,688	8,519
Total ..	2,172	4,741	5,211	926	8,156	8,771	29,977	47,606	4,278	192	7,921	59,997	89,974

MONTHLY Statistics of mortality among horses and ponies in the Madras Presidency during the year 1890–91.

Months.	Number of deaths of horses and ponies due to										Total number of deaths from all causes.
	Disease.					Other causes.					
	Diarrhœa and dysentery.	Anthrax.	Variola.	All other diseases.	Total.	Natural decay.	Accidents.	Snake-bite.	Wild animals.	Total.	
April 1890	1	2	..	3	6	27	2	..	5	34	40
May ,,	..	1	..	16	17	46	8	1	14	69	86
June ,,	..	1	..	12	13	56	8	..	13	77	90
July ,,	..	5	..	36	41	74	8	..	18	100	141
August ,,	3	1	1	14	19	70	4	1	7	82	101
September ,,	1	2	..	6	9	35	3	..	12	50	59
October ,,	..	1	1	15	17	51	11	1	12	75	92
November ,,	..	1	2	10	13	42	7	..	5	54	67
December ,,	1	2	1	3	7	49	4	..	7	60	67
January 1891	3	..	..	24	27	56	5	..	26	87	114
February ,,	3	..	..	13	16	40	2	..	9	51	67
March ,,	3	1	3	7	14	28	2	..	16	46	60
Total ..	15	17	8	159	199	574	64	3	144	785	984

No. 1

Monthly mortality amongst cattle

FROM	DURING	
All Diseases	Aver. (87-88 & 88-89)	——x——
	1889-90	——x x——
	1890-91	——xxx——
Rinderpest with Diarrhœa and Dysentery	Aver. (87-88 & 88-89)	——
	1889-90	— — — —
	1890-91	- - - - - - - -

APRIL MAY JUNE JULY AUGT. SEPT. OCT. NOV. DEC. JAN. FEB. MARCH

23,000
22,000
21,000
20,000
19,000
18,000
17,000
16,000
15,000
14,000
13,000
12,000
11,000
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6,000
5,000
4,000
3,000

All Dis.(ave,87-88 & 88-89)

R. (ave.87-88 & 88-89)

All Dis (90-91)

All Dis.(89-90)

R. (89-90)

R. (90-91)

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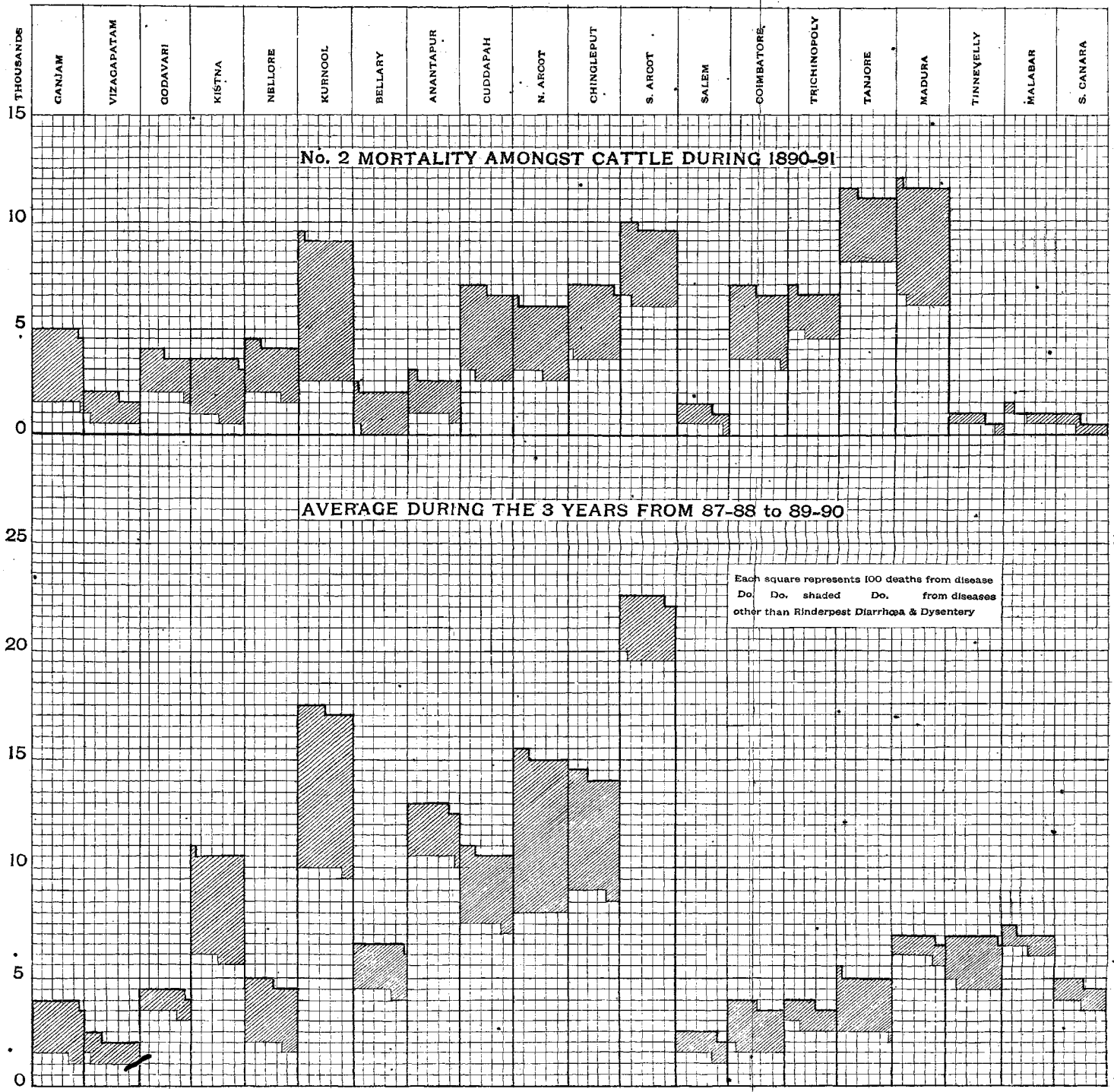

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REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1891-92.

LIBRARY
OF THE
BOMBAY
BRANCH
OF THE
ROYAL ASIATIC SOCIETY

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1893.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1891-92.

I.—Organization and Maintenance of Village Records.

1. The sanction of the Secretary of State for the provisional appointment for a period of five years of a Personal Assistant to the Director for the purpose of supervising the work of the Subordinate Revenue establishments in the maintenance of Land Records and Survey marks and plans having been received, the appointment was filled up under the designation of Deputy Director of the Department (Land Records Branch) on the 2nd November 1891. The newly appointed Deputy Director before the end of March 1892 visited the Trichinopoly, South Arcot and Tanjore districts, and examined thoroughly the work done by the Revenue Inspectors and the state of the village and taluk accounts in two taluks in each district. While at Trichinopoly, which he visited in company with Mr. Cardozo, Mr. Wynch made himself fully acquainted with the system of survey by karnams (village accountants) and their instruction at the survey schools inaugurated in that district under the sanction of Government.

2. The working of the Revenue Inspector staff in the districts visited was found to be open to much improvement. These officers, Mr. Wynch reports, are generally regarded by the Tahsildars "more as assistants for the disposal of references than as inspectors, and are allowed to spend their time" when not detained at head-quarters (which they are, much longer than they should be) "touring from village to village without any system, inquiring into complaints and petitions referred to them for report." "Inspection work is consequently much neglected. Crop registration is checked in a very perfunctory way. Boundary marks are not generally looked after and the examination of village accounts is generally left to be done in the jamabandi cutcherry." As regards the village and taluk accounts, Mr. Wynch found that "the village *statistical* accounts do not receive the same amount of attention as the *revenue* accounts" at the hands of the Revenue Inspectors and taluk officials and that there is "a great want of supervision over the preparation of the taluk accounts." In some taluks there was very great delay in the disposal of applications for taking up, or for transfers of, lands. In the taluks inspected in Trichinopoly and South Arcot the village analysis registers were found to have been very carelessly prepared, though they were on the whole kept better in Tanjore. The firka books had not been completely posted.

The detailed reports of the Deputy Director are forwarded through the Collectors concerned, and necessary steps will be taken by them to rectify any errors that are pointed out. At present, the annual jamabandi (settlement of the demand) is the only occasion on which all the accounts are checked and scrutinized, and the result of such inspection is, as usual, submitted in separate reports to the Board. These reports show that of late greater attention has been devoted to the due maintenance of these statistics than before, though, as pointed out by Mr. Wynch, the attention paid is inadequate in many respects and there is much room for improvement. The Tahsildars, burdened as they have been with a large amount of criminal

work, have had insufficient time to devote to the proper scrutiny of the work of the Revenue Inspectors, and a large amount of revenue inquiry that should be taken up by themselves has often been thrown upon the latter officials. Considerable improvement may be looked for now that Tahsildars are to be so largely relieved of their Magisterial duties, and it is hoped that Mr. Wynch may be able to do much to systematise and improve the work of Revenue Inspectors and village officers by introducing into more backward districts the better systems of administration found in particular districts where these matters have engaged the special attention of the Collector. Much further inspection will be necessary before any rules of general application can be introduced, but much may be done at present by bringing to the notice of Collectors of districts inspected all points where any portion of their account system or of the work of their Revenue Inspectorate is especially unsatisfactory.

3. The re-survey of the Trichinopoly district with the aid of the village accountants was in progress throughout the year under report, and the progress made was on the whole very satisfactory, almost the whole of the work in the Trichinopoly taluk and about one-half in each of the taluks of Kulitalai and Musiri having been completed before the 31st March 1892.

Arrangements were made in the course of the year to train the karnams in survey work, in those portions of the Bellary and Anantapur Districts where survey had been completed but where settlement was in progress; but these arrangements had to be suspended in consequence of the distress that showed itself after the failure of the north-east monsoon, the services of the village officers being required in administering relief. In the Taluks of the Anantapur District where the survey is in progress the kurnams will be instructed as the survey progresses. A similar course will be followed in the South Canara and Malabar Districts in which the Survey department is now at work.

4. A scheme for the training of the karnams of the remaining districts was submitted by Mr. Cardozo, Superintendent of Revenue Survey, and was approved by Government. In the districts named in the margin, which have already been permanently demarcated and surveyed, Mr. Cardozo proposed that a survey school should be opened at each district head-quarters under a qualified instructor, and that the karnams should be sent to undergo training therein in batches not exceeding 20 at a time, the course of instruction lasting for a month, the first half being devoted to the course prescribed in the karnams' manual of surveying, and the second to the surveying and mapping of a block of not less than 40 acres in the neighbourhood of the survey school. The school is to be under the immediate supervision of the Assistant Collector or some other responsible Revenue officer at head-quarters and its monthly cost was estimated at Rs. 65 to Rs. 70 as shown below:—

Ganjam, Vizagapatam, Nellore, Kurnool, Cuddapah, Chingleput, South Arcot, North Arcot, Salem, Coimbatore, Nilgiris, Tanjore, Madura and Tinnevelly.

Pay of Instructor	Rs.	20 to 25
Allowance to 20 karnams at Rs. 2 each	„	40
Contingencies and stationery, &c.	„	5
Total ..	„	65 to 70

The training of the kurnams of a district under the above scheme which provides for the training of only twenty in one month would take several years, and as an alternative scheme Mr. Cardozo suggested that the plan of instructing the karnams by the aid of the Revenue Inspectors might be tried in one district and extended to others if it was found to answer well. Briefly, the plan is to send the Revenue Inspectors of two or three taluks at a time to the survey school for a fortnight * to go through the course and then to require them to instruct the karnams in their respective ranges, either at the taluk head-quarters or at such other place as may be selected by the Collector. In this way, all the karnams in a district could be trained in less than a year.

* This is deemed sufficient as most of the men have already been under instruction with a survey party.

The supply of the necessary survey instruments at the cost of the State to all karnams in Government villages has been approved by Government, the cost of each set being estimated at Rs. 6–8–0 as shown on the margin. Shortly after the close of the year the karnams of Godávari, Kistna, Anantapur, Malabar and South Canara were supplied with these instruments, but with the exception of the Kurnam's school in Bellary no schools for the instruction of kurnams were established during the year.

	Rs.	A.	P.
1 cross staff	0	4	0
1 off-set pole	0	1	0
1 plotting and off-set scale ..	0	2	0
1 pair of plotting compasses ..	2	0	0
1 flat ruler	0	1	0
1 drawing board	0	8	0
Total ..	3	0	0
Add cost of a chain if necessary ..	3	8	0
Grand Total ..	6	8	0

5. A scheme of examination, styled "the Village Officer's Special Test" for testing the fitness of candidates for the offices of karnam (village accountant), assistant karnams, monegar and munsif, was sanctioned by Government during the year, but it is to be enforced only from 1st January 1894, and is not applicable to the Agency tracts in Ganjam, Vizagapatam and Godávari.

The examination will be open to all candidates who have passed the Primary School examination, or any higher examination conducted by the Commissioner for Uncovenanted Civil Service examinations, by the Director of Public Instruction, or by the University, and the fee for admission will be Re. 1 for all persons belonging to the families of karnams, assistant karnams, reddis and munsifs, and Rs. 5 for all others. The candidates for karnam's office must pass in (*a*) the Village Manual of Accounts, (*b*) the powers and duties of village officers, and (*c*) surveying; and for monegar's or munsif's office, in (*a*) powers and duties of village officers and (*b*) village sanitation.

From and after the 1st January 1894, no person, unless specially exempted by the Collector, will be appointed to the office of a karnam, monegar or munsif unless he shall have passed the examination prescribed above.

6. Of the 619 Revenue Inspectors in the Presidency 502 of those performing the duties of the post are reported to have undergone training in survey. It is only in Anantapur that all the Inspectors have received training, but in Ganjam, Kurnool, Bellary, Chingleput, Coimbatore and Nílgiris the proportion not trained is very small.

7. The work in connection with the revision of village establishments was transferred during the year to the Land Revenue Branch of the Board of Revenue. The village establishments in Anantapur were revised during the year and some modifications were sanctioned in regard to the superior village officers of the Kurnool district, where the last previous revision was carried out nearly 30 years ago.

II.—The Analysis of Districts.

8. Owing to census operations and the unfavorable character of the season in a large number of districts, the preparation and checking of the village registers and firka books was not completed during the year, though great progress was made. The extent of arrears for fasli 1299 is somewhat large in Ganjam, Anantapur, Chingleput and Madura and very slight in Kurnool, Nellore and Trichinopoly, as exhibited in the following table :—

Districts.	Number of villages				
	In the district.	For which village registers still remain to be		For which firka books still remain to be	
		Prepared for fasli 1299.	Checked for fasli 1299.	Prepared for fasli 1299.	Checked for fasli 1299.
Ganjam	1,533	500	Not begun in Berhampore and Goomsur.		
Kurnool	789	5	5	11	17
Anantapur	978	138	138	192	965
Nellore	931	5	5	5	5
Chingleput	1,785	30	62	270	1,019
Trichinopoly	1,401	..	..	5	5
Madura	896	147	233	Not begun.	

The work remaining to be done in 13 districts on account of fasli 1300 is given in he following statement :—

Districts.	Total villages in the district.	Number of villages for which				Remarks.
		Village registers still remain to be		Frka books still remain to be		
		Prepared for fasli 1300.	Checked for fasli 1300.	Prepared for fasli 1300.	Checked for fasli 1300.	
Ganjam	1,533	500	Not begun in Berhampore and Goomsur taluks.			The work is very backward in the two taluks of Berhampore and Goomsur, and the Collector has taken steps to clear off the arrears at an early date.
Godávari	1,379	62	90	241	426	
Kurnool	789	5	8	13	19	The arrears relate to Pattikonda and Nandikótkur taluks. Orders have been issued to complete the work without delay.
Anantapur	978	189	189	247	247	Arrears heavy in Dharmavaram and Anantapur taluks.
Nellore	931	67	81	Not begun in Nellore and Kanigiri.		
Chingleput	1,785	190	190	635	1,034	
South Arcot	2,913	793	793	2,123	2,123	
Salem	2,806	..	..	89	104	
Coimbatore	1,508	..	51	..	51	
Trichinopoly	1,401	11	11	96	96	
Tanjore	3,604	195	621	F. 6	F. 11	
Madura	896	163	263	896	896	
Tinnevelly	1,139	29	70	F. 3	F. 4	

The work for fasli 1301 is reported to have been commenced and to be progressing fairly in a few districts.

Much labour has been expended in the preparation of these registers, but the work of keeping them up to date will be very slight and the value of permanent registers of the kind giving, for a long series of years up to the latest for each village and for each group of villages in a Revenue Inspector's charge, full particulars of the area in occupation, the revenue derived from unirrigated lands, the revenue from each source of irrigation, the agricultural stock of the village, the number of its wells, &c., will be appreciated the more the registers are used. The statistics of a village will gradually be brought to a correct standard from which any material deviation will demand intelligent explanation.

9. Very little progress was made towards the completion of the statistical atlas, owing to the pressure of work thrown on the department owing to the state of the season, and to the necessity for awaiting the detailed results of the recent census.

III.—Collection of Revenue and Rental in Precarious Tracts.

10. The revised kistbandi (instalments of revenue) sanctioned in 1889–90 continued to be in force during the year. Owing to the serious failure of the rains in many districts, a considerable portion of the demand both on irrigated and on unirrigated lands had to be remitted, while the collection of the remainder had to be temporarily suspended in some places. The scheme for the remittance of Government revenue by means of Postal money-orders, which was introduced as a tentative measure in the districts of Chingleput, South Arcot, Tanjore, Madura and Tinnevelly during the year 1890–91, was ordered to be continued till August 1893 on the recommendation of Collectors concerned and the Postmaster-General.

IV.—Measures of Protection and Relief.

11. *The Season.*—At the beginning of the year serious anxiety was felt regarding the condition of portions of Chingleput, North Arcot, three taluks of Tinnevelly, and the Polláchi taluk of Coimbatore, comprising an area of 7,600 *square miles. These tracts had in January and February exhibited unmistakable signs of distress, owing to a very serious failure of crops due to the want of seasonable rain and it was found necessary to provide relief work in them. At the end of March works were in progress in the five affected taluks of Chingleput, which gave employment to about 5,300 persons; in the Wandiwash taluk and the Kálahasti zemindari of the North Arcot district, about 2,200 people were employed; in Tinnevelly, the numbers employed amounted to about 1,000; in the Polláchi taluk in Coimbatore, some 600 coolies were employed on a major irrigation work which was started in the worst tract. Kitchens for the distribution of cooked food to destitute women and children unable to work had been started in the affected tracts in the North Arcot district, in which some 300 people, mostly children, were being fed daily. In the Chingleput district, it was not found necessary to introduce this form of relief up to the end of April. During the next three months it was found necessary to start some minor relief works in the southern taluks of Nellore and the Ráyachóti taluk of Cuddapah, but there was so marked an improvement in the prospects in Tinnevelly that that district was removed from the list of affected tracts. At the end of June, the affected area amounted to 3,450 square miles with a population of 950,000.

		Sq. miles.
* Chingleput	.. .. ..	2,300
North Arcot	.. .. ..	1,300
Tinnevelly	.. .. ..	3,700
Coimbatore	.. .. ..	300
	Total ..	7,600

The south-west monsoon rains were unusually late throughout the Presidency, and there was great delay in commencing cultivation, and the distress in Chingleput, North Arcot, Cuddapah and Coimbatore became intensified. During July, the rainfall was fair only in the Northern Circars, the Deccan districts and the south, and, except in Cuddapah, the situation became more grave. In August, anxiety regarding Cuddapah was greatly relieved, but the continued failure of the rains in the Carnatic and Central districts increased the distress in the affected area and caused an extension of the area affected in Coimbatore. At the end of the month sowings were 20 per cent. below the normal, and a considerable area of the crops already sown had withered or was withering in the Carnatic and Central districts. The early part of September was also most unfavorable, but towards the end of the month good rain commenced to fall and greatly improved prospects generally. The situation in Bellary, however, where the rainfall to the end of September was only 7·25 as compared with an average of 16·21 began to cause anxiety. Altogether the rainfall of the south-west monsoon was not only late everywhere, but was seriously deficient except in the Circars, on the west coast and in the south. In Bellary, Anantapur, Chingleput and South Arcot, the fall from June to September was less than half the usual average, and in Coimbatore it was not much above half the average. At the end of September, sowings were nearly 30 per cent. behind the normal, and much of the early sown crop withered and had to be ploughed up. At the end of September, the affected area extended to 7,000 square miles with a population of 2,333,000, and included portion of Chingleput, North Arcot, Salem and Coimbatore. At the end of the month 35,000 persons were employed on relief works and 7,000 were being fed in kitchens.

In October, the rainfall was fair throughout nearly all the southern districts, except a small part of Salem, and in the southern taluks of Nellore. It was, however, deficient in the Circars and the Deccan districts and at the end of the month the situation had become critical in Ganjam, Vizagapatam and the Deccan, but in the Carnatic and Central districts was more favorable. In November, except in the southernmost and two western districts, the rainfall was far below the average, the deficiency being greatest where the fall is usually heaviest during this month. There was scarcely any rain in the upland portions of Kistna and the northern parts of Nellore adjoining, nor in the Deccan districts where the south-west monsoon rains had been

exceedingly short and that of October scanty and where rain seldom falls later in the year. In consequence there was widespread loss of crop and the area actually sown during the month was much below the average. At the end of November serious distress was seen to be almost inevitable in the Deccan districts and in North Nellore. During December, the season was favorable in the Carnatic south of the Pennér, and the Central districts, except the western portion of Salem, the adjoining parts of Coimbatore, and the upland parts of North Arcot, so that all relief was closed soon after the close of the month in Chingleput, and the low country of North Arcot and in Coimbatore. The month, however, brought no improvement in the Deccan districts or in North Nellore, and relief works were opened in Bellary and in Kurnool. At the end of the month the numbers employed were—Chingleput 1,181, North Arcot 3,067 and Coimbatore 2,371, whilst there were 1,473 persons, chiefly children, being fed in North Arcot and Coimbatore. At the end of the month 21,296 persons were engaged on relief works, of whom 6,619 were employed in the districts already noted, where works were closed early in January. Besides the persons already mentioned, 519 others were in receipt of gratuitous relief in Salem and Kurnool. The area which was considered to be affected during the month was 21,366 square miles with a population of over $3\frac{1}{2}$ millions.

On the 12th January 1892, the provisions of the Provincial Famine Code were put in force in six districts * and including the affected portions of Kistna alluded to above, and small sections of North Arcot and Coimbatore where relief was subsequently found to be required, the affected area in that month was determined as 31,069 square miles with a population of nearly five millions. It was subsequently found unnecessary to start relief works in parts of several districts, and at the end of March the affected area was reduced to 22,700 square miles with a population of $3\frac{1}{2}$ millions. During the last three months of the year there was no practical change in the condition of the Presidency, the reduction alluded to being due entirely to a more accurate determination of the area affected. At the end of March relief works affording employment to 46,000 persons were open in seven districts, and in Kistna public works on a larger scale than usual were going on. At the same date kitchens for the distribution of cooked food were open in six districts at which 909 persons were being fed, of whom 450 were fed in Kurnool.

* Deccan—	Carnatic—
Kurnool.	Nellore.
Bellary.	Central—
Anantapur.	Salem.
Cuddapah.	

12. *Communications.*—Good progress was made during the year in the construction of the *East Coast Railway* from Bezváda to Cuttack, a total length of 516 miles, and the progress would have been greater but for delays in the receipt of English stores and loss of time in re-alignments. The work is said to be nearly completed in the Tuni and Vizagapatam divisions and plate-laying has also been begun at Vizagapatam. Progress was also good on the *Dharmavaram-Hindupur Railway* (56 miles) and it is anticipated that at the present rate of progress this railway will be opened for traffic on 1st April 1893. Good progress was impossible on the *Máyavaram-Mutupet Railway* (54 miles) owing to the constant rain of the north-east monsoon, which flooded the land throughout. The *Nílgiri* Railway (17 miles) was also in active progress. The survey of a line of railway from Bezváda to Masulipatam—a distance of 50 miles—was completed by the Madras Railway in April 1891. The survey of a branch line ($60\frac{3}{4}$ miles) from Pálghat through Trichur to Kurrapatnam at the head of the Cochin backwater was completed in December 1891. The plans, sections and estimates relating to the Cuddalore-Pondicherry and Peralam-Karikal lines have been forwarded to the French Government. The plans and estimates of the Madras-Gúdúr and Nellore-Guntúr Railways have been laid before the Government of India. Negotiations were taking place with the Travancore State for the construction of a line from Tinnevelly to Quilon.

13. *Advances to Agriculturists.*—The amount advanced during the year under the Land Improvement and the Agriculturists' Loans Acts aggregated Rs. 16,88,481 against Rs. 2,71,504 disbursed in the previous year. This large increase was mainly

due to the great impetus to well-sinking given by the drought which prevailed in several of the districts. It was due in part also to the favorable terms under which loans were granted under the Special Well rules, which were extended to the Ganjam North Arcot, Coimbatore, and Tinnevelly districts in February 1891 and in August 1891 to the rest of the Presidency. The amount advanced was large in Chingleput, Coimbatore, North Arcot, Cuddapah and Salem. The following table shows the amounts advanced under the two Acts during each of the past five years :—

Year.	Land Improvement Loans Act.		Agriculturists' Loans Act.	
	Budget allotment.	Actual loans.	Budget allotment.	Actual loans.
	Rs.	Rs.	Rs.	Rs.
1887–88	2,00,000	77,507	1,00,000	40,034
1888–89	2,00,000	1,30,622	1,00,000	36,772
1889–90	1,50,000	1,38,690	80,000	44,950
1890–91	2,41,900	2,27,942	58,100	43,562
1891–92	* 13,39,000	15,30,408	* ..	1,58,073

* The total amount sanctioned under the two Loans Acts.

14. *Irrigation.*—The Rushikulya works in Ganjam and the Periyár Project in Madura were in progress during the past year. The amount expended upon them was Rs. 6·4 lakhs and 11 lakhs, respectively, raising the total expenditure up to the end of the year to 24·74 and 37·68 lakhs, respectively, against the sanctioned grants of 43·16 and 56·39. The area likely to be protected when these works are completed is estimated at 100,000 acres under the Rushikulya, and 192,400 acres, including 77,900 acres of double-crop land, under the Periyár Project. About ten miles of the Rushikulya canal was opened for irrigation in the year under report, but the extent irrigated was only 6,000 acres. On the improvements to the Godávari and the Kistna Deltas about Rs. 66,500 and Rs. 4,28,900 were expended during the year. In the last 5 years the expenditure on these accounts aggregated Rs. 4·68 and 25·18 lakhs, respectively, and the area protected by these works has increased by 134,100 and 143,300 acres respectively, including second crop. During the year the sanction of Government was accorded for widening and improving the Cheyár anicut main channel in the North Arcot district at an estimated cost of Rs. 77,000. No funds were available for the prosecution of the Kalingaroyen Channel extension works in Coimbatore sanctioned in the previous year.

Minor Irrigation.—An allotment of 4½ lakhs of rupees was sanctioned in the beginning of the year for the repair of the minor irrigation works. This was subsequently raised to Rs. 5,40,092. This amount was fully expended during the year. The outlay was the highest on record since the transfer of the works to the control of the Revenue Department in 1883–84. More than two-thirds of the expenditure was incurred in the districts of Cuddapah, Nellore, Chingleput, South Arcot, North Arcot and Tinnevelly, where, in consequence of the unfavorable character of the season, works were set on foot as a measure of relief for the distressed population.

V.—Agricultural Experiments.

15. *Agricultural Education.*—The work of the Agricultural College, although controlled by the Educational Department, comes under review by the Director both on its educational side and in relation to the farm attached. The report for the year has been separately noticed and will be finally disposed of by the Educational Department. The abolition of the Junior department in the College was noted in the last report. This caused a reduction in the numbers under training. The curriculum was revised during the year and a commencement made at introducing a new scheme prepared by the committee of experts whose deliberations were referred to in the last report. Final orders have not yet been issued regarding the curriculum and several other matters referred by Government for report in its orders on the Agricultural Committee.

The farm attached to the College is maintained chiefly as a dairy farm. Owing to the very unfavorable character of the season, the financial results of the year were not so satisfactory as in the previous year. The report showed that the dairy herd maintained on the farm was, on the whole, successfully managed, and one very satisfactory feature is the increasing demand shown for the services of the breeding bulls maintained on the farm. In order to provide more fully for the exercise of the students of the College in the manual operations of farm practice, the College farm has recently been enlarged.

The College Veterinary hospital was maintained at a moderate cost during the year, but there was a falling off in the number of cases treated therein. Now that the hospital is in charge of a fully-qualified Veterinary Surgeon, it is hoped that he will be able to make it more efficient as a training school.

16. *Farm Schools.*—No further progress towards the establishment of the farm schools alluded to in paragraph 16 of the last report was possible during the year. The joint report of the Directors of Agriculture and Public Instruction, submitted in May 1891, was not disposed of by Government till after the close of the year, when a revised scheme was drawn up by Government for future guidance, of which the following are the chief features :—

(i) Five districts will be chosen in which farm schools will be opened, and in each a plot of ground for an experimental and demonstrational farm will be selected and acquired.

(ii) A school-house will be erected on, or in close proximity to, each farm and as an annexe thereto. Each school should accommodate about 80 scholars.

(iii) The schools will be exclusively reserved for the practical and theoretical teaching of Agriculture and Veterinary Science on the model of the College of Agriculture, but on a smaller scale, the necessary knowledge in other subjects being secured by fixing a certain test of general educational qualifications before entrance.

(iv) In order to carry out the above scheme, it will be notified that, as soon as the farm schools are sufficiently organised to receive scholars, lads between the ages of fourteen and twenty, who desire either to study Agriculture for private reasons or with a view to going to the College of Agriculture afterwards, will be admitted within the limit of a certain number, either annually or half-yearly, on application, provided they have passed the compulsory portion of the Upper or Lower Secondary examination or the F. A. examination, Matriculation examination, or any other higher test, and that there is room for them.

(v) The curriculum at the farm schools will extend to four years, at the end of which time all pupils will be required to appear for either the Elementary or the Intermediate Technical examination according as they have passed the compulsory portion of the L.S. examination or the compulsory portion of the U.S. examination, or any higher examination as the case may be. Passed Upper Secondary candidates and candidates who have been successful at any higher examination will be eligible for admission to the College of Agriculture.

(vi) Ten scholarships, to last during the prescribed period of residence at the College of Agriculture, will be given each year at each farm school, to be competed for only by those students who have already passed the compulsory subjects of the Upper Secondary examination or some higher examination, and on the understanding that the winners go to the College ; the scholarships to be awarded with reference to the results of the Intermediate Technical examination. This would provide a class of 50 scholars annually, besides such other qualified students from the farm schools as might wish to go to the College of Agriculture on their own account.

(vii) The schools and farms will be under the management of the Director of Agriculture, who will receive any assistance he may require from the Director of Public Instruction in the matter of drawing up the curricula and forming classes in the schools.

The Government has selected the districts of Coimbatore, Godávari and Bellary for the location of three schools, and further suggestions regarding the districts and places to be selected for the remaining two schools are to be submitted; but all

immediate action in the matter has been ordered, on the representation of the Government of India, to be held over pending the receipt of Dr. Voelcker's report on Indian Agriculture and the elaboration by the Government of India, in communication with all local Governments, of the broad principles on which all schemes of Agricultural education and improvement should be based.

The three Inspectors, alluded to in paragraph 17 of the last report as having been deputed to make themselves acquainted with local practices with a view to qualifying themselves to take charge of the proposed farm schools, prosecuted their enquiries in Bellary, Coimbatore and Tanjore during the cultivating season, but the work in Bellary was suspended early in the year owing to the unfavorable character of the season. Towards the end of the year all three were brought to Madras to strengthen the office staff in the Famine Department.

17. A portion of the old Saidápet Farm estate was handed over to the Madras Municipality during the year for the purpose of establishing an extramural cemetery. The remainder of that portion of the estate that was in charge of the department was subsequently transferred to the Educational Department as an addition to the farm of the College of Agriculture.

18. *Dairy Experiments.*—Attention having been drawn to the successful introduction of modern dairy machinery into the Bombay Presidency and to the fact that by its use the cost of supplying wholesome milk for the use of troops and in hospitals can be greatly economised, some experiments in the manufacture of butter by the aid of modern appliances were made at Saidápet. Owing, apparently, to want of experience in the management of the separator and to defective treatment in the manufacture of the butter, the results were inconclusive, but gave promise of better results being secured if the experiments were repeated under more favorable conditions.

19. *Barley.*—It was proposed to repeat the usual offer of prizes for barley grown on the Nílgiris during the year and to restrict the offer to the produce of late sown crops, it having been pointed out that crops at that season produce a higher quantity of malting barley than those sown at the ordinary season. Owing, however, to the unfavorable character of the season, very few ryots came forward to compete for the prizes and what crop was received was of very inferior quality. The offer of prizes was therefore suspended.

20. *Potatoes.*—No report has yet been received on the results obtained with the seed-potatoes imported in 1890–91 and sold to growers on the Nílgiris. Some of the seed sent to the Palnis is said to have done fairly.

21. *Economic Products.*—Early in 1891, an inquiry was commenced regarding the existence of fibres in this Presidency likely to be of value as substitutes for the S. American *Piacava*. That fibre is strong and tough and much used in brush-making. Kittool, the fibre of the sago palm (*Caryota urens*), is largely used as a substitute for it and the palm is found both on the West coast and in the Northern circars to a considerable extent. Further enquiries are being made regarding the supplies that could be obtained if a trade in it were opened up. The fibre of the palmyra palm has also been shown to be a good substitute and further inquiries regarding it are being made, as well as whether other fibres of the description required are available, but the supplies of such fibres in Europe are so large and cheap as not to allow of much competition.

22. Arrangements were made during the year for the collection of specimens of cotton, indigo, gingelly, castor-oil seed, and silk, as well as of cotton and silk fabrics manufactured in the Presidency for the Imperial Institute, and most of the collection was forwarded to the Reporter on Economic Products at Calcutta before the end of the year. A considerable amount of information regarding the manufacture and dyeing of the fabrics was also collected, which, it is understood, will be published by the Reporter on Economic Products.

23. The experiments made by the Madras and South Indian Railway Companies in the use of *Eucalyptus* leaves as disencrustators for locomotive boilers have been reported to be very satisfactory, and the Madras Railway Company is making further experiments in their use.

24. *Coffee-leaf Disease.*—A proposal to revive the investigation carried on some years ago regarding the coffee-leaf disease (*Hemeleia vastatrix*) was mooted during the year by the Wynaad Planters' Association, but, as it was shown that such an investigation could be of value merely from a scientific point of view and would not be likely to result in anything of practical utility, the idea was abandoned.

25. *Agricultural Implements.*—A proposal was made by the Collector of Bellary during the year to carry on a system of experimental ploughings with iron ploughs in different parts of his district, and a small grant of funds was made to enable him to carry it out; owing, however, to the unfavorable character of the season it was not possible to do anything in the matter.

Various forms of iron sugar-mills are now in use in almost all parts of the Presidency, and an inquiry has been set on foot to determine the extent to which they have, since their first introduction by the department in 1881, supplanted the wooden country mill.

26. *Societies.*—The Madras Agri-Horticultural Society received, as usual, a Government grant of Rs. 4,000 towards its operations, and in the form of subscriptions Rs. 2,950, during the year 1891. Its total income amounted to Rs. 11,897–13–3, of which Rs. 3,574–6–3 was for the sale of seeds and plants. The expenditure amounted to Rs. 11,817–4–10, of which Rs. 4,864–14–0 was for establishment, Rupees 1,948–11–10 for seeds and plants purchased, Rs. 1,297–11–9 on account of the annual flower show held at the beginning of the year. The report of the Society is for the official year 1891–92 and shows that the year was a most disastrous one to the gardens, and that owing to the dryness of the season it was not possible to hold the usual flower show in February 1892. No experiments of agricultural interest appear to have been conducted during the year, but the gardens contain a valuable collection of plants of economic interest.

27. *Injurious Insects.*—In July 1891, a few locusts of the species *Acridium œruginosum* appeared in Cuddapah, but it is not reported that they did any material damage. In June a large flight of the same species entered the Vizagapatam district from the Central Provinces, and after causing slight damage disappeared northwards. Further flights followed in July, but no great damage was done. This species appeared in 1878 also after a long period of drought. At about the same time flights of locusts, which the Collector reported to be undoubtedly of the species *A. Peregrinum*, passed through parts of the Ganjam district.

VI.—Cattle Breeding and Veterinary Establishments.

28. *Losses of Live Stock.*—Owing to the disastrous character of the season over a very large area, and especially in parts of the Deccan districts, and to a less extent in the Carnatic and the Central districts, pasturage was for a considerable portion of the year almost entirely non-existent; and the stores of stacked fodder were inadequate to provide for the necessities of more stock than is usually fed at home by the ryots. The breeding and inferior drought cattle, which usually maintain themselves by communal and forest grazing, were reduced to great straits, and in some places large losses occurred from starvation. In many places also the greatest difficulty was experienced in watering the cattle owing to the drying up of all supplies of surface water and the exhausted state of the wells. Full particulars of the losses in each district during the last two years are not yet available, as the stress of work was too great to admit of the usual cattle census being taken in some of the worst affected districts, where, moreover, census would, in numerous villages, have been useless owing to large numbers of the cattle having left the village to seek grazing in distant forest reserves. It is believed, however, that the more valuable cattle have everywhere been generally preserved, and that the losses chiefly comprised old and worn-out or very young stock.

29. *Cattle Disease.*—The appointment of Inspector of Cattle Diseases remained vacant throughout the year, but shortly after its close Veterinary Captain Burke, of the Army Veterinary Department, was appointed to the post by the Government of India, and shortly afterwards the name of the post was altered to Superintendent, Civil Veterinary Department, Madras. This officer joined his appointment after the close of the year, and, pending a decision of the nature of the work of *investigation* on which he is

to be employed, his services are being utilized as Veterinary Lecturer at the College of Agriculture.

30. The subordinate staff of Stock Inspectors was employed almost throughout the year in connection with operations for the relief of distress in various districts. The number of Stock Inspectors on the staff remained at 14 throughout the year, but one Inspector was absent on sick leave. The six specially-selected Inspectors alluded to in paragraph 30 of the last report completed their special course of training at Saidápet to prepare them for taking charge of the veterinary hospitals to be started in connection with the proposed farm schools in May 1891, and were then drafted on to famine relief.

31. The following is an abstract of the mortality recorded amongst all classes of live stock in the Presidency during the last five years. In view of the difficulty of securing anything like an accurate record of the mortality from natural causes and accidents, it was decided during the year to abandon the attempt and to confine the record to deaths from disease, criminal poisoning, snake-bites and the ravages of wild animals, information as to the annual increase or decrease of the stock of the country being obtained by an annual census :—

Causes of Death.	Number of Cattle.				
	1887–88.	1888–89.	1889–90.	1890–91.	1891–92.
1	2	3	4	5	6
Diseases—					
Rinderpest	116,558	95,795	38,252	21,970	10,359
Diarrhœa and dysentery	3,966	47,946	30,368	27,907	18,394
Total ..	120,524	143,741	68,620	49,877	28,753
Anthrax	34,432	19,893	22,502	18,586	16,788
Foot-and-mouth diseases	2,763	5,260	7,811	6,064	6,157
Variola	733	2,841	3,290	2,214	2,508
All others	15,771	24,529	26,243	25,356	33,143
Total from disease ..	174,223	196,264	128,466	102,097	87,349
Others—					
Snake-bite	1,824	2,587	2,895	2,698	1,751
Wild animals	7,591	9,520	10,517	10,533	10,188
Criminal poisoning	44	85	15	24	18
Total from other causes ..	9,459	12,192	13,427	13,255	11,957
Grand Total ..	183,682	208,456	141,893	115,352	99,306

Causes of Death.	Number of Sheep and Goats.					Number of Horses and Ponies.				
	1887–88.	1888–89.	1889–90.	1890–91	1891–92.	1887–88.	1888–89.	1889–90.	1890–91.	1891–92.
	7	8	9	10	11	12	13	14	15	16
Diseases—										
Rinderpest	5,180	4,075	4,492	2,172	1,837	..	..	..	..	..
Diarrhœa and dysentery	959	4,363	5,040	4,741	2,714	2	5	6	15	7
Total ..	6,139	8,438	9,532	6,913	4,551	2	5	6	15	7
Anthrax	1,816	3,253	5,654	5,211	4,391	3	5	9	17	17
Foot-and-mouth diseases	211	989	2,836	926	2,857	..	..	..	..	..
Variola	3,373	7,387	7,962	8,156	5,899	..	1	4	8	1
All others	5,430	9,212	13,615	8,771	13,740	34	88	134	159	130
Total from disease ..	16,969	29,279	39,599	29,977	31,438	39	99	153	199	155
Others—										
Snake-bite	78	241	329	192	153	2	11	10	3	7
Wild animals	3,609	7,364	9,050	7,921	5,942	29	96	130	144	142
Criminal poisoning ..	..	23	2	..	..	..	..	..	..	..
Total from other causes ..	3,687	7,628	9,381	8,113	6,095	31	107	140	147	149
Grand Total ..	20,656	36,907	48,980	38,090	37,533	70	206	293	346	304

32. The table given below shows the proportion of the losses from disease amongst each description of stock during each of the last five years with reference to the numbers reported to exist:—

Year.	Horned cattle.			Sheep and Goats.			Horses and Ponies.		
	Number of		Death rate per mille.	Number of		Death rate per mille.	Number of		Death rate per mille.
	Stock.	Deaths.		Stock.	Deaths.		Stock.	Deaths.	
1887–88	11,522,768	174,223	1·5	9,574,761	16,969	1·7	34,958	39	1·1
1888–89	13,699,395	196,264	14·0	11,389,668	29,279	2·6	39.254	99	2·5
1889–90	14,475,966	128,466	8·8	12,060,982	39,599	3·2	42,735	153	3·5
1890–91	14,958,792	102,097	6·8	12,466,649	29,977	2·4	43,296	199	4·6
Average ..	13,664,230	150,262	7·7	11,395,515	28,956	2·4	40,060	123	2·9
1891–92	14,848,600	87,349	5·8	12,714,832	31,438	2·4	41,591	155	3·7

33. The chief feature of the year was the comparative immunity from serious disease which the cattle enjoyed. The total reported losses (87,000) were only 58 per cent. of the average losses and 15 per cent. less than in 1890–91. The relative smallness of the losses during 1890–91 in comparison with those of the three previous years was pointed out in paragraph 34 of the last report. The losses of 1891–92 were only slightly more than half the average of the three years 1887–88 to 1889–90, and this decrease has occurred whilst there is every reason to believe that the accuracy of registration is increasing. The fluctuations in the monthly numbers of deaths followed much the same course as in previous years. From April to September the number of deaths in each month varied but slightly; there was a considerable increase in October when heavy rain fell in many parts, a decrease in November which was unusually dry, and a rise to the maximum in December, in the latter respect showing a difference from the preceding year, when the later rains having failed the maximum was reached in October, but resembling the average for the three previous years. After December there was a rapid decline in the death-rate from disease to 5,417, a lower monthly mortality than any reported during the last five years by over 1,000 head.

34. Rinderpest, even if the deaths attributed to diarrhœa and dysentery be grouped with those due to that pest, did not cause one-third of the average number of deaths that it had done in the previous four years and not much more than half the number attributed to it in 1890–91. From April to September the number of deaths from these causes declined steadily until in September they only numbered 1,491. The lowest monthly maximum in the preceding four years was 3,234 in June 1890. During October, November and December, there was a slight increase in the number of deaths from these causes; but it is most probable, when the character of the season and the absolute number of deaths reported are considered, that those put down to diarrhœa and dysentery were to a large extent correctly recorded, and the relative immunity of the Presidency from *rinderpest* was very marked. During each of the last three months of the year, about 2,000 deaths were attributed to these causes. Of the total number of deaths (28,753) put down to rinderpest, diarrhœa and dysentery, only 10,359 were registered under rinderpest, and there is no reason to believe that this understated the proportion of deaths caused by that epizootic to any great extent, and the Presidency may be said to be enjoying a general immunity from this disease at present after a long and severe out-break. The only districts which reported any considerable number of deaths from these causes were—Madura (4,152), South Arcot (3,551), Tanjore (2,729), Chingleput (2,708), North Arcot (2,291) and Kistna (2,638), numbers which, as compared with the losses of previous years, are trifling. In Ganjam, the number of deaths (1,661), though not very large, was considerable in proportion to the stock affected. In Coimbatore though the losses were larger (2,196), they were proportionately small.

35. The number of deaths amongst cattle attributed to anthrax showed a further considerable decrease on the previous year, but not nearly so marked an one as in the case of rinderpest. On the other hand, both "foot and mouth" disease and variola are

said to have caused a few more deaths, whilst the number put down to unspecified diseases increased largely over the average of the three preceding years. With cattle in reduced condition, diseases which are ordinarily harmless might readily prove fatal. Anthrax was particularly destructive in North Arcot, Chingleput, South Arcot and Tanjore, these four districts having accounted for just half the total number of deaths attributed to the disease. It is also reported to have caused a large proportion of the deaths in Ganjam. "Foot and mouth" disease was also most exceptionally destructive in Ganjam where 1,932 deaths were registered under this head. Variola is said to have caused 1,035 deaths, or two-fifths of the whole number for the Presidency in Kistna district alone. The very large increase, 7,787 or 30 per cent., over the previous year in the number of deaths attributed to unspecified diseases was distributed over all the districts except Cuddapah, North Arcot, Coimbatore, Trichinopoly, Tanjore and Malabar, and was most marked in the districts noted on the margin and may perhaps be attributed in part to the inclusion of deaths from privation in some cases. As usual Kurnool reports by far the largest number of deaths under this head and as in 1890–91 Madura stands next.

Kistna	713
Kurnool	2,619
Bellary	1,009
Anantapur	828
Salem	2,237

36. The losses from snake-bites decreased from 2,698 to 1,751, and the decrease was spread over the whole Presidency except Ganjam and Vizagapatam. Losses by wild animals also decreased by 345 head. As usual over half of the deaths from this cause occurred in the two West Coast districts, where, as well as in all the other districts except Tinnevelly, Salem, North Arcot, the Deccan districts and Ganjam, there was a marked decrease. The increased losses in Bellary and Kurnool were very marked.

37. The subjoined table shows the action taken in regard to each case of criminal poisoning that was reported—

District.	Number of cattle poisoned.	Action taken in each case.
Godávari	2	(1) In one case the culprit was fined Rs. 30; in default sentenced to 45 days' imprisonment. (2) The other case is under inquiry.
Kistna	4	(1) One was a suspected case and there was no proof, and the viscera was not forwarded for medical examination. (2) In another case the culprits could not be detected for want of sufficient evidence. Information still due for the remaining two cases still under Police investigation.
Kurnool	1	(1) In this case the offender was punished to one day's simple imprisonment and a fine of Rs. 10.
Anantapur	5	(1) In one case the offenders were sentenced to 3 months' rigorous imprisonment. (2) In the second the offenders were sentenced to 6 and 3 months' rigorous imprisonment respectively. (3) In the third case sufficient evidence was not forthcoming to bring the offenders to justice. (4) The fourth has been included by Police in undetected cases. (5) The accused in the fifth case were discharged under section 253, C.P.C.
Cuddapah	1	(1) The two offenders in this case were sentenced each to 6 months' rigorous imprisonment.
Salem	1	(1) The culprit was sentenced to 4 months' rigorous imprisonment.
Madura	3	(1) In two cases the complaint was made on mere suspicion and the Police were asked to stop further inquiry as there was no evidence. The offenders could not be traced in the remaining one case.
Malabar	1	(1) The case is under Police investigation.
Total ..	18	

NOTE.—There were no cases under sheep and goats, horses and ponies.

38. Amongst the *sheep and goats*, although the losses from disease increased slightly, the increase appeared only under two heads, viz., foot and mouth and unspecified diseases. There was, however, a very marked increase in the number of deaths registered under rinderpest in both North Arcot and Tinnevelly, attended with decreases under diarrhœa and dysentery. The losses attributed to anthrax also increased very largely in Godávari, North Arcot, Chingleput and Madura, and those put down to sheep-pox in Bellary, North Arcot, Coimbatore and Madura, but on the whole the total losses from these diseases decreased. In the case of *epizootic aphtha*, the greater part of the losses occurred in Godávari (704), Madura (1,202) and

Tinnevelly (696), whilst elsewhere they were trifling. The increased losses under unspecified diseases were reported most largely from Madura, but there was a large increase also in Tinnevelly, Trichinopoly, Salem, South Arcot, Nellore, Cuddapah and Anantapur, the total increase amounting to nearly 5,000, of which Madura contributed 2,800 and Salem 1,550. The losses from snake-bite and wild animals both decreased and there were no cases of criminal poisoning reported.

39. The deaths of horses and ponies from disease only amounted to 155 against 199 reported in the previous year, and of these 130 were from unspecified causes. Wild animals destroyed 142, of which 44 were in Kurnool, 25 in Bellary, and 15 each in Kistna and Madura. There were 7 deaths amongst this description of stock from snake-bites.

40. *Pony-breeding.*—These operations were confined to two districts—Salem and Coimbatore. In Salem, there were four stallions at work, and 240 mares were covered, as compared with 190 in the previous year when only three stallions worked throughout the year, about two-thirds of the mares being covered at Hosúr and the rest at out-stations. In Coimbatore, there were five stallions at work during the year, of which four covered 50 mares or more each and one only 33. The stallions were for the most part stationed at fixed centres and of the total number of mares covered (238), 47 were covered at Kangyam and 60 at Dhárápuram, the distribution of the coverings between the different taluks of the district is noted on the margin. According to the monthly reports received, the number of ponies castrated during the year was 116 in Salem and 49 in Coimbatore. Three ponies died in Coimbatore after castration and two in Salem, and, owing to the unfavorable character of the season, it was impossible to push these operations vigorously during the year.

Erode	27	Kollegál ..	28
Karúr	48	Bhaváni ..	3
Dhárápuram ..	107	Palladam ..	4
Polláchi ..	19	Udamalpet ..	2

41. The work of the year and the results secured from the coverings of the previous year, 1890–91, are compared below with those of previous years and with those secured in Bombay and Bengal :—

Particulars.	Year.	Madras.			Bombay.	Bengal.
		Salem.	Coimbatore.	Total.		
Mares covered per stallion.	1887	35	28	30·5	35·1	37·8
	1888	50	29	36·	35·6	36·7
	1889	39	42	41	36·3	39·0
	1890–91	47	51	50	37·5	39·5
	1891–92	60	48	53	..	..
Produce foaled per stallion.	1887–88	11·6	5·0	7	11·7	11·3
	1888–89	13·0	3·6	6·4	13·3	10·8
	1889–90	10·6	6·3	7·6	11·8	10·6
	1890–91	8·7	9·8	9·4	11·7	12·6
Percentage of produce foaled to mares covered.	1887–88	36·5	20·2	26	37·4	30·3
	1888–89	31·0	14·0	21	37·3	31·1
	1889–90	38·0	21·0	26	33·6	28·8
	1890–91	27·3	22·3	24	34·7	32·3

As far as coverings are concerned the work done was good; the small decrease in Coimbatore is attributed to the unfavorable character of the season. As to produce obtained from the coverings of the preceding year, there was a marked falling off in Salem and a slight improvement in Coimbatore, but still the percentage of produce obtained from mares covered was small. In Coimbatore, the results obtained from the work of three stallions were very bad, and if the particulars regarding them be eliminated, the percentage of produce foaled would be raised from 24 to 27·6. This even is considerably below the proportion of successful results obtained in Bombay and Bengal. This result may, no doubt, be in part attributed to the unfavorable character of the season. The number of foals obtained by Government stallions since the commencement of operations is 348. The charges incurred during the year were Rs. 4,032.

42. A proposal to assist a planter on the Nílgiris in starting and carrying on mule breeding from country-bred mares was under discussion during the year, but the

idea fell through owing to inability of the Government of India to spare a donkey stallion for the experiment.

VII.—Miscellaneous.

43. *Crop statistics.*—According to the original orders of the Government of India, the submission of two forecast reports regarding paddy, indigo, gingelly and cotton, both early and late, was required, the first dealing roughly with the area sown and the character of each crop, and the second giving the fullest details available as to the area, condition and probable outturn. These reports were submitted for some time, but the Government of India expressed a wish to make some changes both in the number of these reports and in the dates of their submission. Advantage was taken of this opportunity to submit proposals to reduce the number of reports and to slightly alter the dates of their submission so as to embody really useful information as to the area and prospects of the several crops in this Presidency. With the approval and sanction of the Government of India, the several reports are now submitted as under :—

Crops.	Report.		
	First (sowings).	Second (forecast).	Third (forecast).
Paddy	15th October	15th December	15th February.
Indigo	15th September	15th do.	....
Gingelly Early	15th August	1st November	....
Gingelly Late	1st January	15th April	....
Cotton Early	15th August	10th December	10th February.
Cotton Late	10th October		

44. *Agricultural outturn.*—As already noted the season was most unfavorable. The results were shown in a considerably reduced area of crop being sown and in poor average results being obtained. During the year a modification was made in the village record to allow of the area of crop that fails entirely being shown. This area during the past year was very large, amounting to 14 per cent. of the cholum crop and 12 per cent. of the cotton crop. The outturn of the remaining crops that came to harvest was less than two-thirds of an average crop in almost all cases except those of paddy, sugar-cane, and tobacco—crops protected by irrigation in most cases. The ground-nuts were reported to be nearly three-fourths of an average crop. Particulars are given in the subjoined table for the Presidency as a whole :—

Crops.	Area sown.			1891–92.				
				Withered.		Harvested.		
	1888–89.	1890–91.	1891–92.	Area.	Per cent. of total area sown.	Area.	Outturn in annas.	Per cent. of an average crop.
Food grain—	Acs.	Acs.	Acs.	Acs.				
Paddy	5,832,200	5,863,400	5,418,900	186,500	3	5,232,400	9·4	78
Cholum	3,904,600	4,324,000	4,527,300	659,400	14	3,867,900	7·9	58
Cumbu	2,329,700	2,661,100	2,391,500	156,400	7	2,235,100	7·8	57
Ragi	1,547,600	1,581,800	1,603,700	65,100	4	1,538,600	7·6	63
Others including pulses.	5,477,300	4,801,600	4,424,700	372,700	8	4,052,000	*	..
Industrial—								
Sugarcane	59,100	55,900	59,100	1,200	2	57,900	11·2	93
Cotton	1,464,400	1,676,900	1,253,300	154,200	12	1,099,100	7·5	63
Indigo	495,100	249,900	204,800	9,600	5	195,200	7·5	63
Castor-oil seeds	642,800	821,600	690,100	58,000	8	632,100	6·8	47
Gingelly	584,100	733,000	496,100	31,900	6	464,200	7·9	58
Ground-nuts	184,900	251,000	189,000	800	..	188,200	8·4	70
Tobacco	85,800	89,200	68,200	1,600	2	66,600	10·3	80
All others including topes	1,185,200	1,225,900	1,264,200	32,800	3	1,231,400	*	..
Total	23,792,800	24,335,300	22,590,900	1,730,200	8	20,860,700	*	..

* Not reported on.

The relative proportion that the area reported to have withered bore to the total area of each crop reported on in each district is shown in the next table.

Districts.		Paddy.	Cholum.	Cumbu.	Ragi.	Cotton.	Indigo.	Sugarcane.	Castor.	Gingelly.	Ground-nuts.	Tobacco.	Total for all crops.
		P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.	P. CT.
Circars ..	Ganjam	..	..	..	1	2	100	..	..	5	..	10	1
	Vizagapatam ..	..	..	..	..	..	94	..	..	..	..	..	..
	Godávari	1	..	..	..	..	..	2	..	..	..	..	1
	Kistna	..	2	2	..	4	..	..	4	..	..	1	3
Deccan ..	Kurnool	33	19	11	11	12	6	2	8	13	..	13	16
	Bellary	10	43	25	1	52	..	2	12	12	..	..	35
	Anantapur	8	35	18	7	43	51	..	20	6	7	7	28
	Cuddapah	10	6	1	6	2	1	..	5	1	..	..	4
Carnatic ..	Nellore	34	13	9	6	2	12	..	15	3	..	4	17
	Chingleput	6	1	..	1	..	1	..	..	6	1	..	4
	South Arcot ..	2	1	13	3	..	1	2	..	17	1	1	7
Central ..	North Arcot ..	14	1	23	2	19	1	1	..	41	..	..	9
	Salem	16	13	19	11	3	..	11	11	16	8	27	13
	Coimbatore	3	1	1	3	..	..	..	1	..	..	..	1
	Trichinopoly ..	..	..	..	..	1	..	..	1	..	..	..	..
South ..	Tanjore	..	..	1	2	..	..	..	..	..	..	..	..
	Madura	4	2	4	2	..	..	1	1	3	..	..	3
	Tinnevelly	1	1	..	..	..	..	..	27	1	..	..	1
West ..	Malabar	..	..	..	1	..	..	..	..	2	..	..	1
	South Canara ..	..	..	..	..	..	..	59	..	..	..	..	..
	Nilgiris	1	22	..	11	..	..	..	..	37	..	..	1

In the northern coast districts the proportion of failure was small except for indigo in Vizagapatam and Ganjam. In the Deccan districts there was widespread failure of the principal cereal crops, of cotton, indigo and oil-seeds. In the Carnatic districts, Nellore suffered most severely, though the early cereal (cumbu) in South Arcot also withered over a large area. In the central districts, it was in North Arcot and Salem only that the amount of total loss was serious and it was greatest in the latter district. In the remaining districts, it was only in respect to the castor crop in Tinnevelly that the loss was proportionately large.

In the next table the average outturn obtained from that portion of the more important crops which came to harvest is shown in annas for each district, 12 annas representing an average crop:—

Districts.		Paddy.	Cholum.	Cumbu.	Ragi.	Cotton.	Indigo.	Sugarcane.	Castor.	Gingelly.	Ground-nut.	Tobacco.
Circars ..	Ganjam	7	4	4	6	7	..	8	5	5	..	5
	Vizagapatam	7	9	8	9	10	4	4	10	10	..	9
	Godávari	12	9	9	8	13	8	11	7	8	8	11
	Kistna	13	8	8	10	8	8	..	6	6	4	9
Deccan ..	Kurnool	9	6	6	6	6	7	10	5	6	4	7
	Bellary	7	4	4	7	2	..	9	4	4	..	..
	Anantapur	9	6	5	8	5	5	11	5	4	6	8
	Cuddapah	9	7	6	7	7	8	7	5	7	9	9
Carnatic ..	Nellore	7	6	6	6	5	5	5	5	6	7	7
	Chingleput	7	7	6	7	8	7	8	6	5	8	7
	South Arcot	9	7	8	8	8	9	11	7	8	8	9
Centre ..	North Arcot	7	7	6	7	8	7	9	7	5	7	8
	Salem	10	6	5	6	6	9	10	5	5	6	7
	Coimbatore	13	8	7	7	9	..	14	7	7	10	12
	Trichinopoly	10	10	10	12	1	11	12	7	10	8	8
South ..	Tanjore	13	12	8	11	10	11	14	12	10	11	12
	Madura	9	8	6	8	9	7	12	6	7	7	10
	Tinnevelly	8	7	7	6	7	5	10	6	5	4	9
West ..	Malabar	10	6	8	7	..	..	12	6	9	..	10
	South Canara	12	..	..	11	9	..	12	10	10	..	9
	Nilgiris	8	4	..	6	..	..	..	4	4	..	8
Average for Presidency ..		9	7	7	8	7	7	11	6	7	8	10

45. *The total Rail-borne Trade* of the Presidency during 1891–92, owing chiefly to the enormous development of the imports from other provinces, was nearly 7 per cent. greater than the very large traffic of the preceding year. Details for the last seven years are given below :—

Year.	Imports.		Exports.		Internal.		Total.	
	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1885–86	2,272	233	1,993	189	24,000	1,260	28,265	1,682
1886–87	2,951	300	2,526	269	27,988	1,740	33,465	2,309
1887–88	3,486	350	2,957	286	20,997	1,600	27,440	2,236
1888–89	2,919	359	3,684	316	22,773	1,717	29,376	2,392
1889–90	3,783	393	4,311	372	23,752	1,915	31,846	2,680
1890–91	5,353	443	4,306	370	26,983	2,026	36,642	2,839
1891–92	7,027	525	4,716	361	27,305	1,979	39,048	2,865

The total quantity was 39,048,779 maunds, or 2,406,343 maunds more than in the previous and 8,970,000 maunds or 30 per cent. more than the average of the five years immediately preceding the great development of 1890–91. The increase in the value of the articles carried was comparatively small; the total value amounting to Rs. 28,65,35,610, which was only 26 lakhs or not 1 per cent. more than in 1890–91. The increase in quantity took place chiefly, and in value solely, in the imports from other provinces.

In 1890–91, these imports had shown an increase of 41·5 per cent. in volume and about 13 per cent. in value over those of the preceding year, and during the year under reference showed a further development of 1,674,078 maunds or 31 per cent. in quantity, and of 82 lakhs of rupees or 16 per cent. in value. Of the increased volume of imports, Bombay contributed 306,171 maunds and the Nizam's territories 1,862,225 maunds, whilst there was a falling off of 580,476 maunds from the large imports of 1890–91 from Mysore. The great increase in imports was brought about chiefly by the unfavorable character of the season inducing a very brisk inward traffic in food-grains from Bombay and Hyderabad, and also in a great measure owing to the development of the supplies of coal from the latter province; the increase in the latter case amounted to 605,907 maunds. The supply of grain from Mysore fell off by about 576,000 maunds during the year as compared with that of 1890–91.

The exports to other provinces increased by 410,397 maunds or about 9 per cent. in quantity over the large export of the preceding year, but decreased in value by about 9 lakhs of rupees. The increase was almost entirely due to the development of the traffic in coal and coke from Madras to Mysore, and to the very large demand for food-grains (chiefly rice and pulses) which sprang up in that province during the year; the total amount of food-grains exported to Mysore during the year having been about 483,000 maunds more than in 1890–91, and of coal and coke about 427,000 maunds, the total increase in the exports to that province amounted to 686,248 maunds. To Bombay and to Hyderabad there were smaller exports than in 1890–91, by 215,671 and 56,549 maunds, respectively.

The local trade showed a small increase in quantity accompanied by a small decrease in value as compared with 1890–91. There was a very large increase in the grain trade under the influence of the adverse season, and a great decrease in the traffic in oil-seeds and raw cotton from the same cause. There was also a much larger amount of stone and lime carried than in 1890–91, but less railway plant and rolling stock.

46. The distribution of the total trade of the Presidency amongst the different blocks into which it is divided for registration purposes is shown below.

Blocks.	Imports.								
	1890–91.				1891–92.				Increase or decrease percentage.
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		
			Amount.	Percentage.			Amount.	Percentage.	
1	2	3	4	5	6	7	8	9	10
	MAUNDS.	MAUNDS.	MAUNDS.		MAUNDS.	MAUNDS.	MAUNDS.		
Madras port ..	1,189,807	8,124,691	9,314,498	28·8	1,246,327	7,155,630	8,401,957	24·5	— 9·8
Pondicherry ,, ..	23,401	1,502,196	1,525,597	4·7	13,570	1,618,230	1,631,800	4·7	+ 6·9
Negapatam ,, ..	24,744	1,458,486	1,483,230	4·6	13,276	1,140,908	1,154,184	3·4	— 22·2
Tuticorin ,, ..	10,384	1,128,210	1,138,594	3·5	16,007	1,041,674	1,057,681	3·1	— 7·1
Calicut ,, ..	65,279	725,497	790,776	2·4	31,761	448,629	480,390	1.4	— 39·3
Ceded Districts and Kurnool	764,029	1,374,829	2,138,858	6·6	1,712,162	1,650,411	3,362,573	9·8	+ 57·2
Nellore	23,918	223,077	246,995	·8	38,986	269,500	308,486	·9	+ 25·0
Chingleput and North Arcot	542,898	2,322,738	2,865,636	8·9	903,824	3,060,816	3,964,640	11·5	+ 38·3
South Arcot, Tanjore and Trichinopoly.	232,557	3,608,033	3,840,590	11·9	146,780	3,660,251	3,807,031	11·1	— ·9
Madura and Tinnevelly	375,754	3,823,887	4,199,641	13·0	41,899	4,023,748	4,065,647	11·8	— 3·2
Salem, Coimbatore and Malabar ..	1,541,053	2,535,516	4,076,569	12·6	1,595,932	3,109,955	4,705,887	13·7	+ 15·4
Kistna	559,605	155,726	715,331	2·2	1,267,043	125,008	1,392,051	4·1	+ 94·6
Total ..	5,353,429	26,982,886	32,336,315	100·0	7,027,507	27,304,760	34,332,267	100·0	+ 6·2

Blocks.	Exports.								
	1890–91.				1891–92.				Increase or decrease percentage.
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		
			Amount.	Percentage.			Amount.	Percentage.	
	11	12	13	14	15	16	17	18	19
	MAUNDS.	MAUNDS.	MAUNDS.		MAUNDS.	MAUNDS.	MAUNDS.		
Madras port ..	1,370,492	4,209,358	5,579,850	17·8	2,053,213	3,757,119	5,810,332	18·1	+ 4·3
Pondicherry ,, ..	2,085	170,015	173,106	·6	8,675	170,144	178,819	·5	+ 3·3
Negapatam ,, ..	4,632	1,168,451	1,173,083	3·8	1,515	1,398,193	1,399,708	4·4	+ 18·3
Tuticorin ,, ..	412	1,322,061	1,322,473	4·2	234	1,361,309	1,361,543	4·3	+ 3·0
Calicut ,, ..	51,229	690,501	741,730	2·4	180,216	970,728	1,150,944	3·6	+ 55·2
Ceded Districts and Kurnool	628,876	1,989,768	2,618,644	8·4	482,894	2,028,329	2,511,223	7·8	— 4·1
Nellore	1,359	455,869	457,228	1·5	1,302	507,858	509,160	1·6	+ 11·3
Chingleput and North Arcot	688,489	7,400,614	8,089,103	25·9	641,323	6,540,597	7,181,920	22·4	— 11·2
South Arcot, Tanjore and Trichinopoly..	51,215	5,266,023	5,317,238	17·0	89,690	6,451,702	6,541,392	20·4	+ 23·0
Madura and Tinnevelly	6,825	1,703,862	1,710,687	5·5	5,052	1,769,018	1,774,070	5·6	+ 37·1
Salem, Coimbatore and Malabar ..	1,105,229	2,484,681	3,589,910	11·2	875,934	2,002,021	2,877,955	9·0	— 20·1
Kistna	395,278	120,683	515,961	1·7	376,464	347,742	724,206	2·3	+ 40·3
Total ..	4,306,121	26,982,886	31,289,007	100·0	4,716,512	27,304,760	32,021,272	100·0	— 2·3

The variations have been fully noticed elsewhere. The import trade of Kistna continues to increase and during the year under notice, there was a satisfactory recovery in the exports. The trade of Nellore increased largely also, but the increased imports were not altogether satisfactory, being to a considerable extent food-grains. The short local supplies of grain in the Ceded Districts and Kurnool caused the greater part of the largely increased imports, and the unfavorable season led to a practical stoppage of exports, but the latter were still far larger than in 1889–90. The same reason explains the variations in the trade of Chingleput and North Arcot and the Salem, Coimbatore and Malabar blocks. In the more southern districts, the

improved prospects led to better trade, the more bulky exports increasing and the imports of grain decreasing.

47. *Road Traffic.*—In G.O., dated 1st November 1888, No. 754, sanction was granted for the registration of interprovincial traffic at 7 stations on 7 roads and of local or internal traffic at 103 stations on 54 roads. The whole of the interprovincial traffic alluded to has been recorded; and the returns of local traffic registered from 1888–89 to 1890–91 at 65 stations on 29 roads have already been published. During 1891–92 the internal trade on 11 roads was registered at 18 stations as shown in the following table:—

Districts.	Number and description of road.	Registration of stations.
Nellore	16 Ongole to Cumbum	1. Ongole. 2. Santanutalapad. 3. Chinnaarikatla at the junction with a cross road from Kanigiri to Podili. 4. Near Lingamgunta where the road from Kanigiri meets it.
	17. Nellore to Badvel	1. Near Sangam.
	19. Nellore to Madras	1. Gúdur. 2. Náyudupet.
Kurnool	20. Cumbum to Kurnool	1. Taticherla at the junction with the road from Badvél to Cumbum. 2. Kalva.
	21. Nandyál to Chagalamarri and Cuddapah.	1. Dibaguntla where the road intersects the Rampur pass road from Pyápali.
	22. Kurnool to Gooty	1. Pyápali where the Rampur road meets it.
North Arcot ..	26. Road from Arcot to Pondicherry ..	1. Wandiwash.
	27. Vellore to Tiruvannámalai	1. Kanamangalam the point where a branch leaves for Arcot-Arni road. 2. Pólur.
South Arcot	29. Villupuram to Trichinopoly	1. Sendamangalam at the junction with the road from Panruti and Cuddalore. 2 Aivathugudi at the intersection of Vriddháchalam-Kallakurchi road.
	30. Panruti to Kumbakónam	1. Sathiatope at the head of Viranam tank where a road leaves for Mannárgudi.
	32. Tiruvannámalai to Krishnagiri ..	1. Singarampettai or Chengamma pass.

Traffic was also registered during the cold season in Vizagapatam at the marginally-noted four stations for the periods specified against each on the recommendation of the Collector of the district as the plains were threatened with severe scarcity and the traffic with the interior was rapidly assuming large proportions.

Stations.	Period.
Pottangi	10th December 1891 to 30th June 1892.
Korapet ..	1st January 1892 to 1st May 1892.
Rayagada ..	
Bissamkattak	

APPENDIX I.

From Veterinary Captain R. W. BURKE, Superintendent, Civil Veterinary Department, Madras, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Chepauk, 20th June 1892, No. 94.

In submitting the accompanying returns showing the strength and expenditure of the Cattle Disease Prevention Department and the manner in which the several Stock Inspectors were employed during the official year 1891–92, I have the honour to state that I was not in charge of the department for any period for which I am requested to submit a report. The report is for the official year ending 31st March 1892, and I took over charge of the department on the 6th May 1892.

2. It would appear from the returns that the men in the department were engaged on famine duty almost throughout the year, except the two, who, in addition to their famine duties, were employed at the cattle fairs of Tiruvannámalai (South Arcot) and Madura. Copy of the report submitted by Stock Inspector Moses Abraham is enclosed.

3. There has been no Veterinary officer in charge during the year.

STATEMENT showing the work done by Stock Inspectors during the official year 1891–92.

Name.	Nature of work done.	Remarks.	M.	D.
1. P. Raghava Pillai.	Deputed for famine duty in North Arcot and Kurnool.			
2. K. Padmanadhaya.	.....	On sick leave from 8th February 1891, to 7th May 1892	15	0
3. M. Venketramana Sastri.	On famine duty at North Arcot and Kurnool.			
4. A. Cantbaya Mudaliar.	From 1st April to 18th May 1891 employed on cattle disease prevention duty, also attended cattle fair, Madura, and from 19th May 1891 to March 1892, on famine duty in North Arcot and Cuddapah.			
5. B. K. Santaya ...	Famine duty in North Arcot and Bellary.	Privilege leave from 18th January to 7th February 1892 ...	0	21
6. K. Sethu Row ...	Do. do.			
7. C. Viswanatha Iyer.	On famine duty in Chingleput, Cuddapah, North Arcot and Anantapur.			
8. V. P. Subramoney Mudaliar.	On famine duty in Chingleput and Salem.			
9. V. Seethamboo Devoo.	On famine duty in North Arcot and Bellary.			
10. G. Rungiah Naidu.	On famine duty in Chingleput and Bellary.			
11. M. Husain Ali	On famine duty in Chingleput, Salem and Cuddapah.			
12. V. Chockalingam Pillai.	On famine duty in Chingleput and Anantapur.			
13. R. Kanniah Naidu.	On famine duty in North Arcot and Anantapur.			
14. Moses Abraham ..	On famine duty in Chingleput from April to 9th August 1891, and attended the cattle fair at Tiruvannámalai (South Arcot) at the latter end of December 1891; and again deputed for famine duty in Salem from January to February 1892.	Sick leave from 10th August to 11th December 1891 and from 2nd March to 1st April 1892 ...	4	29

STATEMENT showing the actual charges incurred during the Official year 1891–92.

Pay and Allowance.	RS.	A.	P.
Inspector of Cattle diseases (vacant)	...		
Stock Inspectors	12,655	1	2
Office establishment	887	11	4
Contingent charges	120	3	11
Total ...	13,663	0	5

STATEMENT showing the number of doses of Medicines despatched to the undermentioned districts during the official year 1891–92.

Districts.	Astringent powder for rinderpest, 2nd stage.	Carbolic balls for anthrax and rinderpest, 1st stage.	Foot and mouth disease for external application.	Foot and mouth disease to make gargle.	Cinchona febrifuge.	Disinfectants.	
						Macdougal's powder.	Roll sulphur.
	DOSES.	DOSES.	lb.	lb.	lb.	CWT. lb.	CWT. lb.
Chingleput	..	195	..	..	..	..	..
Ganjam	500	..	..	..	..	..	..
Godávari	250	..	..	10	..	..	..
Kistna	500	500	..	..	..	..	..
Madras (Municipality) ..	100	90	..	..	..	..	..
Salem	..	200	..	..	..	..	..
Tanjore	500	300	..	..	..	..	..
Total ..	1,850	1,285	..	10	..	..	..

Letter from Mr. MOSES ABRAHAM, Stock Inspector of North Arcot District, to the Inspector of Cattle Diseases, Madras Presidency (through the Collector of South Arcot), dated Chepauk, 19th December 1891.

I beg to submit a report on the cattle fair held at Tiruvannámalai during the Karthigai festival of 1891.

2. The total number of cattle that were brought to the fair was 10,836, and that of the country ponies 104, making a grand total of 10,940. The fair lasted till the evening of the 17th instant.

3. Cattle were brought from Bangalore, Mysore, Gudiyátam, Punganúr, Salem, Malur, Kumbakónam, and from several villages close to Tiruvannámalai. Of these cattle, those from Bangalore were the best. Most of the indigenous cattle were brought by a few traders from Negapatam for the purpose of being exported to Ceylon.

4. There was a good supply of water at the Samudram tank and a few ponds close to the cattle-stand. There was no scarcity either for paddy-straw or green grass, the former suited better to the cattle than the latter, the weather being rainy, and was sold dear.

5. The cattle-stand was kept clean and the sanitary condition was satisfactory. There was no outbreak of contageous diseases either among cattle or ponies.

APPENDIX II.

From Veterinary Captain R.W. BURKE, Superintendent, Civil Veterinary Department, Madras, to the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture, dated Chepauk, 20th July 1892, No. 118.

With reference to Board's Memorandum, Mis. No. 5595, dated 28th June 1892, I have the honour to submit a review on statistics of cattle mortality in the Madras Presidency during the year 1891–92.

Mortality.

Cattle.—During 1891–92, there were 99,307 deaths among cattle registered in the Madras Presidency. This death-rate shows a decrease of 223,411, which is due to omission of deaths from accidents and natural causes noted in the previous year. If we compare deaths due to causes actually noted in the current year with those of last year, excluding accidents and natufal causes, we shall find that there is still a decrease of 16,045.

The table attached shows in abstract form the means of comparing the mortality under two principal causes of death during 1891–92 with the result of the previous years.

MORTALITY amongst live-stock for a series of years, 1888—92.

Years.	Total deaths.	Deaths due to disease.						Deaths due to other causes.				
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	Other diseases.	Natural decay.	Accidents.	Snake-bite.	Wild animals.	Criminal poisoning.
Among Cattle.												
1888–89	346,936	95,795	47,946	19,893	5,260	2,841	24,529	129,471	9,009	2,587	9,520	85
1889–90	327,855	38,252	30,368	22,502	7,811	3,290	26,243	163,848	22,144	2,895	10,517	15
1890–91	322,717	21,970	27,907	18,586	6,064	2,214	25,356	197,736	9,629	2,698	10,533	24
1891–92	99,307	10,359	18,394	16,788	6,157	2,508	33,143	..	..	1,751	10,189	18
Among Sheep and Goats.												
1888–89	78,666	4,075	4,363	3,253	989	7,387	9,212	30,174	11,585	241	7,364	23
1889–90	101,494	4,492	5,040	5,654	2,836	7,962	13,615	40,699	11,815	329	9,050	2
1890–91	89,974	2,172	4,741	5,211	926	8,156	8,771	47,606	4,278	192	7,921	..
1891–92	37,554	1,837	2,714	4,391	2,857	5,899	13,750	..	..	153	5,953	..
Among Horses and Ponies.												
1888–89	530	..	5	5	..	1	88	256	68	11	96	..
1889–90	843	..	6	9	..	4	134	484	66	10	130	..
1890–91	984	..	15	17	..	8	159	574	64	3	144	..
1891–92	304	..	7	17	..	1	130	..	..	7	142	..

It will be seen that under each of the classified causes of death, excepting Variola and Epizootic Aphtha, there has been a decrease in the registered mortality, and under the unspecified diseases an increase.

During 1891–92, the largest number of deaths took place in December 1891 and the least in February 1892. A gradual rise was noted in October 1891, and a decline in March 1892.

The death-rate under diarrhœa and dysentery being less than that of the former year, shows an improvement in the record of cases, and is proof of how much more is yet needed for the proper education of Stock Inspectors and others engaged in registration; for there can be no doubt that many of the deaths registered as from diarrhœa and dysentery were in reality deaths from rinderpest.

2. *Sheep and Goats.*—The annual death-rate for sheep and goats was 37,554. In accordance with the statistical evidence of last year, there is a decrease of 536 cases, *minus* those already excluded under headings of accidents and natural decay. The mortality under Epizootic Aphtha is very high, being nearly three times that of the previous year.

3. *Horses and Ponies.*—The average death-rate of the different districts among horses and ponies was rather less than that of last year.

The death-rates in each district in 1891–92 are given on the attached statements. The largest mortality among cattle occurred in Madura district and the least in Nílgiri district.

Among sheep and goats also the largest mortality was in Madura district and the least in South Canara. The mortality under unspecified diseases was also high being nearly double.

Among horses and ponies, the largest mortality was in Kurnool district and the least in South Arcot.

APPENDIX III.

STATISTICS of Mortality among Cattle reported in the Presidency of Madras during the year 1891–92.

Districts.	Total stock.	Deaths due to disease.								Deaths due to other causes.				Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.		Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
								Number.	Rate per mille.						
1. Ganjam	233,100	805	856	1,299	1,932	..	924	5,816	25	44	113	..	157	5,973	26
2. Vizagapatam * ..	129,330	63	220	187	214	192	491	1,367	11	28	26	..	54	1,421	12
3. Godávari	863,453	45	1,271	1,046	206	6	642	3,216	4	105	206	2	313	3,529	4
4. Kistna	1,115,318	116	2,522	1,422	124	1,035	2,037	7,256	6	150	269	4	423	7,679	7
5. Kurnool	632,400	187	330	702	45	17	7,781	9,062	14	99	551	1	651	9,713	16
6. Bellary	655,046	69	47	374	82	2	2,650	3,224	5	14	279	..	293	3,517	5
7. Anantapur	602,600	19	134	208	126	19	1,773	2,279	4	15	181	5	201	2,480	4
8. Cuddapah	878,880	229	550	771	101	30	1,658	3,339	3	33	602	1	636	3,975	4
9. Nellore	673,790	75	122	266	10	35	1,370	1,878	3	17	93	..	110	1,988	3
10. Chingleput	439,500	1,384	1,324	2,543	224	30	1,226	6,731	14	355	33	..	388	7,119	15
11. South Arcot	1,080,097	3,020	531	1,738	163	..	616	6,068	6	95	82	..	177	6,245	6
12. North Arcot	883,000	951	1,340	2,708	245	28	810	6,082	7	233	677	..	910	6,992	8
13. Salem	1,097,300	122	795	201	535	306	2,751	4,710	4	52	505	1	558	5,268	5
14. Coimbatore	1,233,900	533	1,663	264	242	300	2,140	5,142	4	83	621	..	704	5,846	5
15. Trichinopoly	646,200	132	421	291	217	38	326	1,425	2	64	23	..	87	1,512	2
16. Tanjore	813,010	1,126	1,603	1,460	513	54	1,214	5,970	7	106	7	..	113	6,083	7
17. Madura	649,800	397	3,755	1,107	763	381	3,802	10,205	16	141	206	3	350	10,555	16
18. Tinnevelly	508,200	115	438	55	263	32	438	1,341	3	48	86	..	134	1,475	3
19. Nílgiris	68,100	499	45	..	25	..	25	594	8	3	445	..	448	1,042	15
20. Malabar	945,230	147	390	2	55	1	172	767	1	39	2,192	1	2,232	2,999	2
21. South Canara ..	700,300	325	37	144	72	2	297	877	1	27	2,992	..	3,019	3,896	6
Total ..	14,848,600	10,359	18,394	16,788	6,157	2,508	33,143	87,349	5·81	1,751	10,189	18	11,958	99,307	6·62
* In Zemindari	..	53	135	141	141	114	217	801	..	14	13	..	27	828	..

Statistics of Mortality among Sheep and Goats reported in the Presidency of Madras during the year 1891–92.

Districts.	Total stock.	Deaths due to disease.								Deaths due to other causes.			Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola sheep-pox.	All other diseases.	Total.		Snake-bite.	Wild animals.	Total.	Number.	Rate per mille.
								Number.	Rate per mille.					
1. Ganjam	52,614	4	35	7	20	..	39	105	2	1	31	32	137	3
2. Vizagapatam *	45,670	3	45	15	3	..	64	130	2	..	43	43	173	2
3. Godávari	176,666	30	43	107	704	80	6	970	6	1	16	17	987	7
4. Kistna	532,443	..	1	28	..	20	287	336	1	5	429	434	770	2
5. Kurnool	586,782	25	28	118	..	21	355	547	1	15	479	494	1,041	2
6. Bellary	610,734	..	65	1,143	..	2,582	442	4,232	7	1	290	291	4,523	7
7. Anantapur	891,804	60	133	107	2	1,133	1,063	2,498	3	1	542	543	3,041	4
8. Cuddapah	1,261,970	195	342	705	35	138	1,424	2,839	2	4	1,023	1,027	3,866	3
9. Nellore	620,345	..	..	19	..	3	570	592	1	3	151	154	746	1
10. Chingleput	269,525	180	154	312	44	101	233	1,024	4	29	135	164	1,188	4
11. South Arcot	904,084	104	..	24	2	..	530	660	1	2	6	8	668	1
12. North Arcot	712,810	533	15	850	..	355	137	1,890	3	6	285	191	2,181	4
13. Salem	1,210,683	37	57	35	29	61	1,623	1,842	2	7	629	636	2,478	2
14. Coimbatore	1,363,956	71	311	49	41	206	692	1,370	1	14	579	593	1,963	1
15. Trichinopoly	1,203,103	71	139	53	65	46	290	664	1	13	248	261	925	1
16. Tanjore	565,250	2	27	19	10	..	107	165	..	2	26	28	193	..
17. Madura	712,138	69	1,051	720	1,202	945	4,573	8,560	12	41	378	419	8,979	13
18. Tinnevelly	907,140	453	259	75	696	202	1,277	2,962	3	8	523	531	3,493	4
19. Nilgiris	8,060	..	..	..	..	..	33	33	4	..	8	8	41	5
20. Malabar	68,520	..	9	..	..	6	5	20	..	..	104	104	124	2
21. South Canara	10,499	..	..	5	4	..	..	9	..	..	28	28	37	4
Total ..	12,714,832	1,837	2,714	4,391	2,857	5,899	13,750	31,448	3	153	5,953	6,106	37,554	3
* In Zemindari	..	3	15	3	45	..	10	76	..	..	29	29	105	..

STATISTICS of Mortality reported among Horses and Ponies in the Presidency of Madras during the year 1891–92.

Districts.	Total stock for 1891-92.	Deaths due to disease.						Deaths due to other causes.			Total deaths from all causes.	
		Anthrax.	Diarrhœa and dysentery.	Variola.	All other diseases.	Total. Number.	Total. Rate per mille.	Snake-bite.	Wild animals.	Total.	Number.	Rate per mille.
1. Ganjam	222	..	..	..	..	..	..	..	..	..	..	..
2. Vizagapatam *	123	..	2	..	1	3	30	..	..	..	3	30
3. Godávari	2,157	2	..	..	11	13	7	..	5	5	18	9
4. Kistna	3,907	..	..	..	3	3	1	..	15	15	18	4
5. Kurnool	3,400	1	2	..	36	39	11	1	44	45	84	29
6. Bellary	4,771	..	..	..	17	17	4	..	25	25	42	9
7. Anantapur	3,127	4	..	1	18	23	7	1	7	8	31	10
8. Cuddapah	1,562	..	..	..	..	..	..	..	9	9	9	5
9. Nellore	1,196	9	..	..	4	13	12	..	4	4	17	15
10. Chingleput	888	..	..	..	2	2	2	1	..	1	3	3
11. South Arcot	2,557	..	..	..	..	..	..	..	1	1	1	3
12. North Arcot	2,382	1	2	..	2	5	2	..	1	1	6	3
13. Salem	3,631	..	..	..	4	4	1	1	1	2	6	2
14. Coimbatore	3,652	..	..	..	9	9	2	..	7	7	16	4
15. Trichinopoly	845	..	..	..	..	..	..	..	..	..	..	..
16. Tanjore	1,135	..	..	..	1	1	1	1	..	1	2	1
17. Madura	3,055	..	2	..	16	18	6	1	15	16	34	11
18. Tinnevelly	550	..	..	..	..	..	..	..	..	..	..	..
19. Nilgiris	1,359	..	..	..	..	..	..	..	6	6	6	4
20. Malabar	835	..	..	..	4	4	4	..	2	2	6	7
21. South Canara	192	..	..	..	1	1	5	1	..	1	2	10
Total ..	41,590	17	7	1	130	155	3·58	7	142	149	304	7·39
* In Zemindari	..	..	2	..	1	3	..	..	..	..	3	..

MONTHLY statistics of Mortality among Horses and Ponies in the Madras Presidency during 1891–92.

Months.	Disease.					Other causes.			Total from all causes.
	Diarrhœa and dysentery.	Anthrax.	Variola.	All other diseases.	Total.	Snake-bite.	Wild animals.	Total.	
April 1891 ..	1	3	..	4	8	..	16	16	24
May ,, ..	..	..	..	14	14	1	9	10	24
June ,, ..	..	10	..	8	18	..	8	8	26
July ,, ..	2	..	..	17	19	1	18	19	38
August ,, ..	..	3	..	17	20	2	17	19	39
September ,, ..	1	1	..	12	14	..	10	10	24
October ,, ..	..	..	..	5	5	..	7	7	12
November ,, ..	1	..	1	7	9	..	14	14	23
December ,, ..	..	..	..	5	5	2	14	16	21
January 1892 ..	2	..	..	20	22	..	9	9	31
February ,, ..	..	..	..	8	8	1	4	5	13
March ,, ..	..	..	..	5	5	..	16	16	21
Total ..	7	17	1	130	155	7	142	149	304

MONTHLY MORTALITY AMONGST CATTLE

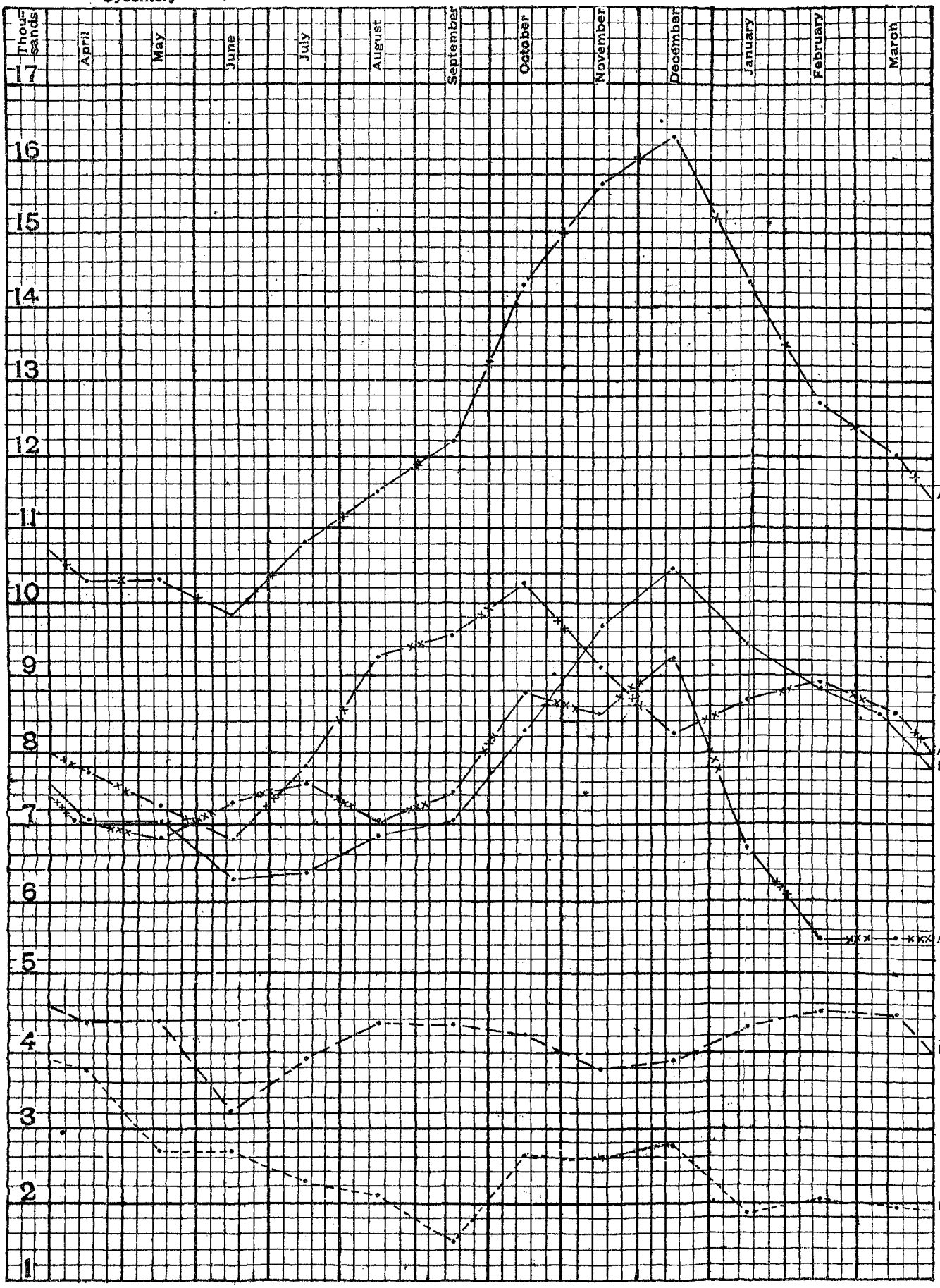
From All Diseases Rinderpest with Diarrhœa and Dysentery

Average 87-88 to 90-91 — A. D. ——x——

1890-91 — ——xx——

1891-92 — ——xxx——

R. ——————



Reg: No. 642 Copies 750

Zinco., Survey Office, Madras.
1892

MONTHLY statistics of Mortality among Live-stock cattle and sheep in the Madras Presidency during the year 1891–92.

Months.	Number of deaths of cattle due to disease.						
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.
1	2	3	4	5	6	7	8
April 1891	1,320	2,466	953	341	164	1,822	7,066
May ,, ...	1,293	1,397	1,444	567	247	1,861	6,809
June ,, ...	1,037	1,636	1,674	364	164	2,430	7,305
July ,, ...	778	1,462	1,490	576	231	3,043	7,580
August ,, ...	795	1,283	1,390	610	161	2,779	7,018
September ,, ...	533	958	1,347	636	58	3,886	7,418
October ,, ...	1,155	1,449	1,749	597	261	3,582	8,793
November ,, ...	872	1,727	2,207	439	136	309	8,471
December ,, ...	801	1,985	1,980	700	288	3,505	9,259
January 1892	661	1,190	1,135	468	206	3,057	6,717
February ,, ...	441	1,582	719	441	233	2,001	5,417
March ,, ...	673	1,259	700	418	359	2,085	5,494
Total * ..	10,359	18,394	16,788	6,157	2,508	33,143	87,349

Months.	Number of deaths of cattle due to disease—*cont.*				Total deaths of cattle from all causes.
	Other causes.				
	Snake-bite.	Poisoning.	Wild animals.	Total.	
	9	10	11	12	13
April 1891	124	1	678	803	7,869
May ,, ...	157	..	785	942	7,751
June ,, ...	128	..	844	972	8,277
July ,, ...	139	..	954	1,093	8,673
August ,, ...	199	..	1,045	1,244	8,264
September ,, ...	157	4	985	1,146	8,564
October ,, ...	152	2	1,056	1,210	10,003
November ,, ...	165	1	894	1,060	9,531
December ,, ...	159	6	877	1,042	10,301
January 1892	141	2	823	966	7,683
February ,, ...	109	..	600	709	6,126
March ,, ...	121	2	648	771	6,277
Total ..	* 1,751	18	10,189	11,958	99,307

Months.	Number of deaths of sheep and goats due to										
	Disease.							Other causes.			Total from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Snake-bite.	Wild animals.	Total.	
April 1891 ..	54	435	253	32	267	573	1,614	14	537	552	2,166
May ,, ..	192	155	487	64	492	887	2,277	15	517	532	2,809
June ,, ..	34	104	282	27	283	479	1,209	15	475	490	1,699
July ,, ..	105	51	202	11	534	586	1,489	5	607	612	2,101
August ,, ..	83	135	500	44	358	440	1,610	19	640	659	2,259
September ,, ..	44	91	163	94	394	1,509	2,295	12	587	599	2,894
October ,, ..	587	268	525	48	163	2,468	4,059	5	564	569	4,628
November ,, ..	286	295	905	881	331	1,731	4,429	23	466	489	4,918
December ,, ..	54	431	371	1,255	992	2,522	5,625	15	569	584	6,209
January 1892 ..	109	275	142	46	370	1,294	2,236	16	336	352	2,588
February ,, ..	266	134	268	174	1,057	523	2,422	6	306	312	2,734
March ,, ..	23	290	293	181	658	738	2,183	8	345	353	2,536
* Total ..	* 1,837	2,714	4,391	2,857	5,899	13,750	31,448	153	5,953	6,106	37,554

* Includes the Zemindari figures for Vizagapatam.

G.O., dated 10th January 1893, No. 12, Revenue:—

Read—the following Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 5th October 1892, No. 669:—

Resolution—dated 5th October 1892, No. 669.

The Board resolves to submit the enclosed report on the operations of the Department of Land Records and Agriculture during the year 1891–92 for the information of Government.

2. The department was in charge of Mr. Clogstoun throughout the year, but, owing to the demands made on his time by the famine, arrangements were made towards the end of the year for the discharge of the duties of the Director by the First Member of the Board.

The Deputy Director, Agricultural Branch, was on duty at head-quarters throughout the year, and for the greater part of it was engaged in performing the duty of Secretary in the famine branch.

Towards the end of the year, sanction for the appointment of a Deputy Director in the Land Records Branch was received from the Secretary of State and Mr. L. M. Wynch, I.C.S., was selected to fill the post. He entered on his duties on the 2nd November 1891.

The appointment of Inspector of Cattle Diseases remained vacant throughout the year, and shortly after its close, the title of the appointment was altered to Superintendent, Civil Veterinary Department, Madras, to which post Veterinary Captain Burke, A.V.D., was appointed by the Government of India.

The Deputy Inspector of Cattle Diseases was as usual employed in charge of Pony-breeding operations in Salem and Coimbatore throughout the year. The Director regrets to state that Mr. Shunker, who had held the post for over ten years, died in July last. The Sub-Assistant Director of Agriculture was employed at head-quarters on statistical work, chiefly in connection with the proposed statistical atlas, throughout the year.

3. The work of the department is dealt with in the report under the sub-heads prescribed by the Government of India.

(A true Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Order—dated 10th January 1893, No. 12, Revenue.

Miscellaneous.

With its Proceedings read above, the Board of Revenue submits its report on the administration of the Department of Land Records and Agriculture during the year 1891–92.

2. *Land Records.*—Paragraphs 1 and 2 of the report deal with the work done during the year by the newly appointed Deputy Director of the Land Records Branch. This officer, whose appointment was sanctioned in November 1891, devoted his attention, during the remaining portion of the year, to investigating the work done by Revenue

Inspectors and examining the state of the village and taluk accounts in the three districts of Trichinopoly, South Arcot and Tanjore. His inspections have so far shown that there is room for much improvement in the method of keeping village and taluk accounts and that there is an utter want of system in the work of Revenue Inspectors who are generally regarded more as assistants to the Tahsildars for the disposal of references than as inspectors and neglect many important duties such as the checking of village accounts and the examination of boundary marks. The Government need hardly impress on the Board the importance, from an administrative point of view, of a well organized Revenue Inspector staff and the desirability of remedying, as soon as possible, the defects brought to light by the Deputy Director by introducing general rules prescribing a regular system of work. The re-survey of the Trichinopoly district, with the aid of village accountants, made satisfactory progress during the year; the subject has been dealt with by Government in its review of the administration report of the Survey Department for 1891–92 and calls for no further remarks. The Board should give its early attention to the question of training all village karnams in survey and entrusting them with the work of sub-division measurement in those districts where settlement is in progress. The only remaining event of importance in the year's administration was the introduction of the "Village Officer's Special Test Examination." This test, which is to be enforced from the 1st January 1894, will ensure the appointment of intelligent village officers and result, it is hoped, in greater accuracy in the keeping of village accounts and an improvement in village administration generally.

3. "*Analysis of districts.*"—The important work of preparing village registers—firka books—appears to be still far from complete in several districts. The arrears are discreditable in Ganjam, Chingleput and Madura. The Government cannot accept the taking of the census and the unfavorable character of the season as valid excuses for the tardy progress which is being made and desires the Board to insist on the arrears being cleared off without further delay.

4. The year under review was marked by severe agricultural distress due to the partial failure of two successive monsoons. Chingleput, North Arcot, Tinnevelly and Coimbatore were the first districts to be affected, but the distress gradually spread to other parts of the Presidency and finally became intensified in Salem, Cuddapah, Bellary, Anantapur, Kurnool and Nellore. Famine relief works had to be opened in all the districts last mentioned, and, at the close of the year under review, the number of people on these works amounted to 46,000, while 909 persons were receiving gratuitous relief. The Board summarises at paragraph 11 of the report under review the area and population affected by famine at different periods of the year and the measures adopted to relieve distress. The subject has also been dealt with in the monthly season reports submitted by the Board to Government and it is unnecessary to enter into it at further length in the present review. Mr. Benson, the Deputy Director in charge of the Agricultural Department, was retained at head-quarters during the greater part of the year to perform the duty of Secretary in the Famine branch of the Board's office, and no progress could, in consequence, be made in the conduct of agricultural experiments. A scheme for the establishment of Farm schools at five agricultural centres was sanctioned after the close of the year, but action on the scheme has been deferred at the suggestion of the Government of India, pending the receipt of Dr. Voelcker's report on Indian Agriculture and the elaboration by the Supreme Government of a general scheme of agricultural education and improvement.

5. *Veterinary Department.*—The newly created office of Superintendent, Civil Veterinary Department, was filled up soon after the close of the year. It is intended to depute the Superintendent to Poona as soon as the Bacteriological laboratory is fully equipped, with a view to his acquiring a practical knowledge of the methods there adopted in the investigation of the origin and treatment of epizootic diseases. In the meantime the Superintendent, besides being the general adviser of the Board and Government in veterinary and horse-breeding questions, is being employed in delivering lectures in veterinary science to the students of the Madras College of Agriculture. The existing staff of Stock Inspectors was engaged throughout the year under review on famine duty and no attempt was consequently made to investigate or combat cattle disease during the year.

6. *Mortality amongst cattle from disease and other causes.*—The Board has abandoned as impracticable all endeavour to secure a record of deaths among cattle from natural causes and accidents, and the figures given under this head in the report under review are therefore confined to deaths due to disease, criminal poisoning, snake-bite and wild animals. The statistics of mortality from these causes are reviewed at paragraphs 33—37 of the Board's report; it is satisfactory to find that there has been a marked decrease during 1891-92 in the number of deaths from rinderpest as compared with previous years. The Government is not prepared to acquiesce in the Board's decision that the attempt to record mortality from natural causes and accidents should be given up on account of the difficulty of obtaining accurate returns. A similar proposal made by the Board last year on the same grounds was negatived by Government. There is no apparent reason why, if the work of village karnams is properly supervised, the returns of mortality under these heads should not approach to some degree of accuracy, and His Excellency the Governor in Council must again ask the Board to reconsider its decision in the matter and to persist in the endeavour to secure reliable statistics.

No particular remarks are called for on the subject of crop statistics and rail-borne trade which are fully dealt with by the Board in paragraphs 43—47 of the report under review.

(True Extract.)

(Signed) E. GIBSON,
Ag. Secretary to Government.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1892-93.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1893.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1892-93.

I.—Organization and Maintenance of Village Records.

The Deputy Director, Land Records Branch, continued his inspections of the state of village and taluk accounts and the work done by revenue inspectors during the months of April — June in the districts of Madura and Tinnevelly; and the Salem district was inspected in September. The results of the inspections in these districts as well as in those inspected last year were subsequently summarised and reviewed in detail by the Board. From October to December the Deputy Director was engaged in making inquiries in the districts of Anantapur, Kurnool and Cuddapah into the correctness of the registration by the village officers of the total area under occupation. One result of the Deputy Director's inspections has been the issue of a revised form of revenue inspectors' diary with instructions calculated to regulate their touring and to systematise the inspection work done by them. Detailed instructions have also been drawn up by the Deputy Director for the maintenance of boundary marks and for the replacement of missing marks, and the restoration of demarcation will be commenced in earnest when arrangements can be made for attaching a small survey staff to each district. In the course of his tours the Deputy Director has given great attention to the working of the village and taluk accounts in view to their early revision where such a course is found to be necessary. The present forms were issued in 1887 subject to alteration after five years' experience.

2. The special knowledge acquired by the Deputy Director of the forms of village and taluk accounts and their actual working was utilized during the remaining months of the year (January—March) in reviewing the reports received from the Collectors on the state of the village and taluk accounts inspected by them and their divisional officers at jamabandi.

3. The scheme approved by Government in 1891, under which it was proposed to instruct karnams (village accountants) in survey work by the aid of revenue inspectors under the control of the Director has been abandoned in favour of a system under which the training is carried out at schools established in each taluk where the teaching is carried out by Assistant Superintendents or Sub-Assistants subject to the control of the Superintendent of Revenue Survey. The schools are opened during the recess (June to September), and the course of instruction at each school occupies about 30 days. The karnams will be taught to demarcate, measure and map fields as explained in the Manual of Survey for karnams and also to subdivide survey fields and to plot the sub-divisions in large scale maps of the survey field. The revenue inspectors will attend the schools and go through the same course of training as the karnams. The working of the whole scheme will be under the supervision of a Deputy Superintendent except in the Madras district where the Deputy Superintendent in charge of the Central office will supervise. In 1893–94, the work will be finished in Ganjám, Vizagapatam, Chingleput, Madras, South Arcot, Madura, Salem and Tinnevelly. The other districts will be taken up in 1894–95. In the districts now under survey, the karnams are being trained as survey progresses.

4. Up to the end of 1892–93, 649 revenue inspectors and 2,036 karnams have been instructed in survey. Survey instruments are being supplied to karnams as they are trained at a cost of Rs. 6–8–0 per set. Of the 619 revenue inspectors in the Presidency, 505 of those performing the duties of the post are reported to have undergone training in survey. In North Arcot and Coimbatore, all the inspectors have received training and the proportion of untrained men is large only in Vizagapatam, Cuddapah, Salem, Madura, Tinnevelly and South Canara.

5. The resurvey of the Trichinopoly district with the aid of the village accountants (karnams) was in progress throughout the year under report, the progress made being very satisfactory, four-fifths of the district having been surveyed from July 1891 to March 1893 at a cost of Rs. 36 per square mile.

The new village survey maps comprise a map of the whole village on a scale of 16 inches to the mile, and a map of each block of about 160 acres, into which every village is divided on a scale of 40 inches to the mile. The maps are of exceptional excellence.

The resurvey of three taluks of the Gódávari district and of three more of the Kistna district was also in progress in the year under report by the same agency. Fair progress has been made. The services of karnams are also being utilized in the initial survey of the Anantapur, Malabar and South Canara districts, but hitherto only to a small extent. Karnams have also been employed in the Rayadrug and Kudligi taluks of Bellary on the subdivision of interstitial fields in connection with settlement operations. In the Bellary and Tanjore districts they are also engaged in the preparation of the accounts necessary for the introduction of the new settlement rates.

II.—Analysis of Districts.

6. The compilation of village registers of statistics and the firka books has been completed up to fasli 1300 (1890–91) in eight districts and nearly so in most of the others, but the progress made during the year in clearing off the arrears that existed in some of the latter has not been satisfactory. Little or no work was done in Ganjám, Anantapur, Salem and Tinnevelly, and it will be seen from the subjoined statement that in the two former districts there are still considerable arrears pertaining to fasli 1299 (1889–90), while in Chingleput and Madura these arrears show but little diminution as compared with the figures in the last report:—

Districts.	Number of villages					
	In the district.	For which village registers still remain to be		For which firka books still remain to be		
		Prepared for fasli 1299.	Checked for fasli 1299.	Prepared for fasli 1299.	Checked for fasli 1299.	
Ganjám	1,533	896	Not begun in Berhampur and Goomsur			The progress made is very slow especially in section VI. There are also heavy arrears pertaining to faslis prior to 1299.
Anantapur	978	44	Not begun in Gooty and Dharmavaram.	52	Not begun in Gooty and Dharmavaram.	
Chingleput	1,785	23	39	47	* 831	* The arrear is chiefly in the checking of section I-(*a*); the checking of other sections is pretty well in advance. There are also arrears in firka books pertaining to faslis prior to 1299.
Madura	896	147	147	24	Not begun.	

The work remaining to be done in ten districts for fasli 1300 is given in the following statement. The arrears especially in the checking of the registers are somewhat large in Ganjám, Anantapur, Chingleput and Madura. The special attention of

the Deputy Director will be given during his visit to Ganjám to the necessity for the early completion of these records, and he will report as to the causes which apparently bar their punctual preparation.

Districts.	Number of villages					
	In the district	For which village registers still remain to be		For which firka books still remain to be		
		Prepared for fasli 1300.	Checked for fasli 1300.	Prepared for fasli 1300.	Checked for fasli 1300.	
Gánjám	1,533	* 890	Not begun in Berhampur and Goomsur.			* Refers chiefly to section VI.
Gódávari	1,379	2	2	10	10	
Nellore	931	2	2	..	Not begun	
Anantapur	978	44	369	102	369	
Chingleput	1,785	35	40	174	† 831	† Refers chiefly to section I (*a*).
Salem	2,806	..	..	..	104	
Coimbatore	1,508	..	51	155	560	
South Arcot	2,913	..	41	..	14	
Madura	896	147	151	24	567	
Tinnevelly	1,139	4	5	6 firkas	12 firkas	

Full information as to the work pertaining to the accounts of fasli 1301 will not be available until the next annual land revenue settlement reports are received.

7. Reports have been received from the Collectors of Vizagapatam, Gódávari, Kistna, Cuddapah, North Arcot, Chingleput, Tanjore and Trichinopoly on the economic condition of their districts as disclosed by a scrutiny of the registers supplemented by inquiries made in villages at the time of jamabandi. These reports have been, as a rule, of too general a character and wanting in detail, while in some instances they were incomplete and did not clearly indicate what the agricultural peculiarities of the tracts noticed are, whilst in most cases they were not adequately reviewed by the Collectors submitting them.

8. Not much progress was possible during the year in the preparation of the statistical atlas, partly because of the pressure of duties connected with the state of the season on the establishments, but chiefly because the census data did not become available till quite recently. The whole of the information collected is now being revised and the atlas will be completed at an early date.

III.—Collection of Revenue in Precarious Tracts.

9. The revised kistbandi (instalments of revenue) sanctioned in 1889–90 continued in force during the year. The kistbandi of the agency portion of the Palkonda taluk in Vizagapatam which had been in force from the time the taluk was rented was modified, the kists being made payable in the middle of October, November, December and February instead of in the middle of August, October, December and February.

Owing to the failure of the rains of the north-east monsoon in the southern districts, considerable remissions mostly on irrigated land and to a small extent on unirrigated land became necessary.

The scheme for the remittance of Government revenue by means of postal money orders which has been in force since August 1890 was continued still as a tentative measure in the districts of Chingleput, South Arcot, Tanjore, Madura and Tinnevelly. Up to date it has been availed of only in about 1,500 cases involving about Rupees 20,000. It has been resorted to for the most part by ryotwari holders, and even in these cases it is reported that this mode of remittance has been adopted not from an appreciation of its merits, but from a desire to spite the monigars and to create evidence in support of claims to the lands concerned.

It was decided during the year that the implements of husbandry and one pair of ploughing cattle for each holding should be exempted from distraint for arrears of land revenue.

IV.—Measures of Protection.

10. *Communications.*—Little progress was made in the construction of the East Coast Railway owing to the smallness of the grant available for outlay in India during 1892–93: the Bezwada to Gódávari section (93 miles) was opened for passenger traffic in February last, and a further extent of 171 miles has recently been thrown open, thus connecting by rail the whole of the deltas of the Gódávari and Kistna rivers with the Deccan districts of the Presidency in which failures of rain and consequent famines are so frequent and with the rest of the Presidency. The Dharmavaram-Hindupur Railway (56 miles) was completed during the year and was thrown open to traffic with the exception of $8\frac{1}{4}$ miles near the Mysore frontier which was awaiting completion of the Mysore State Railway. Fair progress was made on the Máyavaram-Muttupet Railway (54 miles), but work is being carried on under difficulties owing to the water-logged condition of the district through which the line passes and the difficulty of obtaining labour. Active progress was also made throughout the length of the Nilgiri Railway; the proposed extension of this line to Ootacamund is now under survey. The Mysore Government has undertaken a reconnaissance of routes in connection with a project for connecting the West Coast with the interior by a line joining the Mysore State Railway or the Southern Mahratta Railway; while the Madras Railway Company has applied for permission to make a survey of a line from Shoranur to Trichur.

11. *Advances to agriculturists.*—Advances were made during the year under the Land Improvement and the Agriculturists' Loans Acts to the amount of Rs. 22,75,007, against Rs. 16,85,665 disbursed in the previous year. Nearly the whole of the former sum was disbursed in the first six months of the year, as, on account of financial considerations, it was found necessary to discontinue temporarily the grant of loans after the 30th September 1892, and to suspend the payment of the second instalment in all cases in which this course could be taken without risk of serious loss to the borrowers. But for these restrictive orders, the advances would undoubtedly have been much larger. The large demand for loans was due to the great impetus to well-sinking given by the recent droughts in several districts. The amounts advanced were large in Coimbatore, Cuddapah, Bellary, Kurnool, North Arcot and Nellore. The following table shows the amounts advanced under the two Acts during each of the past six years:—

Year.	Budget allotment under both Acts.	Advances under	
		The Land Improvement Loans Act.	The Agriculturists' Loans Act.
	Rs.	Rs.	Rs.
1887–88	2,00,000	77,507	40,034
1888–89	2,00,000	1,30,822	36,517
1889–90	1,50,000	1,38,690	44,950
1890–91	2,41,900	2,27,942	43,562
1891–92	13,39,000	15,28,407	1,57,258
1892–93	23,00,000	20,41,809	2,33,198

In July and August 1892, the Deputy Director of Land Records visited selected taluks in six districts with a view to inquiring into the working of the accounts connected with loans and to consolidating and amending the forms of accounts in use. A complete set of forms with rules was issued in March 1893.

12. *Irrigation.*—Progress on the Rushikulya works in Ganjám and the Periyár Project in Madura continued during the year; the amount expended upon them being Rs. 4·95 and 13·13 lakhs respectively, which raised the total expenditure up to the end of 1892–93 to 29·69 and 50·81 lakhs respectively, against sanctioned grants of 43·16 and 56·39 lakhs. These works are expected to protect, when completed, an area of 100,000 acres in the case of the former and of 192,400 acres in that of the latter. Nine miles of the Rushikulya canal were opened for irrigation in the year under report in addition to the ten miles opened in the previous year, but the ryots

were allowed to take the water gratis as in the previous year. The area charged during the year was only 3,508 acres of first crop and 675 of second crop. A sum of Rs. 1,647 only was spent on improvements to the Gódávari delta system during the year. The area irrigated, 697,388 acres, was considerably greater than the extent anticipated as the "ultimate" under the system, viz., 630,000 acres. On improvements to the Kistna delta 3·06 lakhs were expended during the year, raising the total expenditure to 107·73 lakhs. The area protected by this work during 1892–93 was 471,401 acres.

The Kurnool-Cuddapah canal, which was purchased by Government in 1882–83 for 216 lakhs has shown an increase in the area protected by it since then. It rose from 17,834 acres in 1882–83 to 24,848 acres in 1890–91 and in the year under review it stood at 30,550 acres. There was an abnormal rise to 73,500 acres in 1891–92 consequent on scanty rainfall. The possibilities of the further extension of irrigation under the canal have of late been under consideration, and the report of a Special Deputy Collector who was deputed to enquire into the matter was recently submitted to Government with recommendation as to the future management of the work.

13. *Minor irrigation.*—An allotment of 4 lakhs of rupees was sanctioned in the beginning of the year for the repair of the minor irrigation works. Out of this sum, Rs. 35,958 were placed at the disposal of the Public Works Department for expenditure on works to be executed by Professional agency, leaving the balance, Rs. 3,64,042, for repairs to be undertaken by the Revenue Department. The actual expenditure, however, amounted to Rs. 3,78,437, or Rs. 14,395 in excess of the allotment. The expenditure was generally satisfactory in all the districts and it exceeded the allotment by Rs. 29,000 in Madura, Nellore, Anantapur, Tinnevelly and Vizagapatam. The excess expenditure was due, in the case of the first four districts, to the unfavorable character of the season which rendered it desirable to afford labour in the affected tracts, and in the case of Vizagapatam, to the repair of the irrigation works in Palkonda, which had been greatly neglected during the time the taluk was leased.

V.—Agricultural Experiments.

14. *Agricultural education.*—Owing to the fact that the future of the College of Agriculture is still uncertain pending decision on Dr. Voelcker's report, the numbers under instruction there continued small. No change was made in the curriculum during the year, but the new courses introduced in 1891–92 appear to be satisfactory. The Superintendent, Civil Veterinary Department, delivered two courses of lectures on Veterinary Science at the College.

The farm attached to the College was worked during the year at a very small cost, notwithstanding the unfavorable character of the latter part of the season. The yield of milk obtained showed a small decrease, which an examination of the record does not explain. The outturns obtained from some crops of paddy grown on the farm were fair, but otherwise the yields from the crops were light. Altogether 58·22 acres were sown and the crop on 5·86 acres failed entirely. Considering the season the results were fair.

Early in the year the Government sanctioned a scheme for organising five Farm-schools, with farms attached, in the Mofussil, and preparations were made for starting them. The preparations, however, were shortly after brought to a standstill, the Government of India having requested that action might be suspended pending receipt of Dr. Voelcker's report and the formulation of conclusions thereon.

15. *Dairy experiments.*—The experiments alluded to in paragraph 18 of the last report have not been carried further, as the Principal, College of Agriculture, reported that he was unable to spare the time that would be required to allow of any conclusive results being obtained. The Government also negatived a proposal to secure the services of a dairying expert to carry out further experiments, as it considered the climate of Madras unsuitable, and that the number of European troops at Madras was too small to make the establishment of a departmental dairy profitable.

16. *Agricultural enquiry.*—The Sub-Assistant Director of Agriculture was deputed during the year to make a full and detailed enquiry into the growth of ground-nuts in South Arcot and the adjoining districts. He has prepared a valuable report based on the results of his enquiry, which will be published very shortly. The same officer was also deputed to the Coimbatore District to collect information regarding the system of grass farming pursued in that district, and his report thereon was embodied in a Bulletin issued during the year.

17. *Agricultural implements.*—No new implements were tried during the year, nor is there anything special to record under this head. A full enquiry was made during the year as to the extent to which iron sugar mills have superseded the old wooden mills in different parts of the country. The results of this enquiry may be summed up by saying that, except in Ganjám and South Canara, the iron mills are making their way throughout the Presidency. In Gódávari, Bellary, the greater part of Coimbatore, and in Trichinopoly they have almost entirely superseded the wooden mills. In Vizagapatam, Kurnool, Anantapur, Cuddapah, North and South Arcot, and in Salem, though the iron mills are used in parts of the districts to some extent, there is still ample scope for their more extensive use.

18. *Bulletins.*—The following Bulletins containing general information of an agricultural character were published during the year :—

No. 24.—Names of the field crops grown in the Madras Presidency.
„ 25.—The palmyra palm and its uses.
„ 26.—Sugar mills.
„ 27.—Grass-farming in Coimbatore.

Arrangements were made during the year by the Government of India for arranging these publications and others of similar character issued in other Provinces in a series, to be entitled the " Agricultural Ledger Series."

19. *Experimental Crops.*—Owing to the failure of the north-east monsoon rainfall, sown barley crop was a failure on the Nilgiris, and there was no competition for the prizes offered.

A favorable report on the results of some small experiments made on the Kallimalais, in Salem, on the growth of wheat from seed obtained from the Central Provinces was received during the year, and it is proposed to make further experiments in the upland parts of the Presidency.

Reports were received during the year regarding these experiments made on the Nilgiris and Palnis in 1891, with seed potatoes imported from England. The seed was received too early in the season, and became partially damaged before the sowing season commenced. The results on the Nilgiris were not satisfactory, the outturn being small, though the quality was good. On the Palnis, with a small quantity of the seed, fair results were obtained.

20. *Brush-making fibres.*—The Collectors of all districts, except Madras, Chingleput and Tanjore, were supplied with information to enable them to report whether Kittul fibre of quality similar to that used by the Ordnance Department could be obtained. Samples were obtained from Vizagapatam and certain taluks of Malabar, but the only sample found to be good was from the Kóttayam taluk in Malabar. The estimated price of it, viz., 1 to 2 rupees a pound was, however, considered high. The manufacture of Kittul fibre horse-brushes is being discontinued by the Ordnance Department, as brushes of this fibre have been condemned after a lengthy trial.

The collection of samples of palmyra fibre was continued, and a sample received from Nellore was said to be suitable for brush-making. Part of a dark coloured specimen of fibre received from North Arcot was also pronounced fair, but not equal to Piacava. Regarding a specimen of the fibre exported from Pámban to Colombo for the manufacture of brushes for rough use, rough hats, mats and baskets, and valued at Pámban at Rs. 10 per cwt., the Inspector-General of Ordnance was of opinion that it was not suited for making gun brushes, though it might be for making other brushes, but a specimen of the fibre prepared in South Arcot, at a cost of about 3 annas a pound, was deemed a good substitute for Piacava for manufacturing gun

brushes. It is thus evident that by careful selection and treatment, an abundant supply of palmyra fibre equal to the Piacava could be procured. Between April and October 1892, 158 cwts. of fibre having been exported from Pámban, a large trade in palmyra fibre has recently sprung up on the coast of Madura and Tinnevelly. In Tinnevelly, about 500 tons of fibre appear to be extracted every month. Now that this product is being exported by private agency, no further action by Government is necessary in the matter.

Fibres of the cocoanut, American aloe, *Coccinea Indica* (Tamil Kóvai), the root of a grass called Páváthirapil in Tinnevelly, and of another grass called Veenapullalu (*Aristida setacea*) in Nellore and Kurnool, and the root of a plant called Púndi kodi in Chingleput, used for making inferior brushes for white-washing, weaving, &c., were collected and forwarded to the Reporter on Economic Products to the Government of India and are alluded to by him in his hand-book on brush-making fibres.

21. *Collections for the Imperial Institute* were made during the year of—

(1) Cotton cloths of various kinds from Vizagapatam, Arni (Chingleput district), Chicacole (Ganjám) and Coimbatore, together with specimens of the yarns used in their manufacture and of block painted cloths from Arcot and Kálahasti; cotton carpets from Coimbatore and Vellore, together with a full account of the materials used in dyeing the carpets.

(2) Silk used at Ariyalur (Trichinopoly) and Kollegal (Coimbatore) and silk fabrics from Tanjore and Bellary.

(3) Cane sugar and jaggery produced in Coimbatore, Salem, South Arcot, Cuddapah, Bellary and Ganjám, together with a full account of the varieties of cane grown and of the processes of manufacture, &c.; of cocoanut jaggery from Malabar and Coimbatore; palmyra jaggery, sugar and sugarcandy from Tinnevelly; and date jaggery from Cuddapah.

(4) Ground-nuts in the pod, oil and oil-cakes and specimens of ground-nut plants to show the mode of growth of the pods.

(5) Plain and coloured specimens of Palghat mats, together with specimens of the sedges used in their manufacture.

22. Besides the above a collection of ethnological specimens, showing clothing, jewelry, household utensils, &c., of the hill tribes of the Nilgiris and Anamalais and of the Lambadies of the Ceded Districts, was made for the Indian Museum, Calcutta, and specimens of the seed and lint of different varieties of cotton produced in Kistna, Bellary, Cuddapah, Coimbatore and Tinnevelly, together with information regarding the localities and the nature of the soils best suited for their cultivation, their special uses, &c., for the American Consul, Calcutta.

23. *Phosphatic deposits.*—Dr. Warth, Officiating Superintendent of the Madras Central Museum, drew attention to an extensive deposit of phosphatic nodules in the Trichinopoly district, where about 4,000 tons are estimated to be available on the surface and much larger quantities imbedded in the deposits which cover the country. Specimens of the nodules have been analysed by various authorities, with the result that the deposit compares favorably as regards the average proportion of phosphate of lime which it contains (about 57 per cent.) with most of those in North and South Carolina and with the coprolitic deposits found in different parts of England, whilst the percentage of insoluble siliceous matter is also small; but, as it contains a large proportion of carbonate of lime and of iron oxide and alumina, it probably could not be economically exported for conversion into superphosphate. The presence of a rather large proportion of carbonate of lime is favorable to their use direct on the land. It is hoped that private enterprise will undertake the collection of the nodules, and it seems probable that it may prove profitable to utilise them locally in this country in a finely ground state, as a manure in tea and coffee plantations, &c.

24. *Injurious insects.*—In May locusts were reported to be damaging the young crops in parts of Madura and Tinnevelly, but these turned out on examination of specimens to be chiefly insects belonging to the family *Acrididæ*, of doubtful genus, although specimens of *Acridium Aeruginosum* were also collected. They disappeared

without doing much damage. Some small damage was also done in part of the Markapur taluk in Kurnool by a flight of grasshoppers, the majority of which were found to belong to the genus *Hieroglypus*. Locusts were again reported to have appeared in the Chingleput district in October, but though specimens were forwarded to Calcutta, no report thereon has been received.

25. *Societies.*—The Director continued to be a member of the Committee of the Madras Agri-Horticultural Society, the operations of which were continued on the same lines as heretofore. The income of the society amounted to Rs. 10,086, of which Rs. 3,500 was from the Government grant and Rs. 2,411 from subscriptions. The number of members fell off by 10 although 13 new members were elected against 7 in the previous year. The annual flower show was held in February and was well attended. The exhibits compared favorably both as to number and quality with those at the last preceding show. Various improvements were made in the gardens and a large number of plants of economic interest were distributed to planters and others.

VI.—Cattle-breeding and Veterinary Establishments.

26. *Losses of live-stock.*—Owing to the long continued drought and the drying up of the pastures and sources of water-supply consequent thereon, the sufferings of the cattle over a very large area continued to be severe up to the setting in of the south-west monsoon rains. Thereafter all danger of loss from this cause was removed till towards the end of the year, when the failure of the north-east monsoon rainfall caused considerable losses in the southern districts; the inhabitants of the Ramnad zemindari being reduced to great straits to maintain their cattle, and being in many cases obliged to sell them off at nominal rates, owing to their inability to feed them. From the 1st of April last, the attempt to record the mortality of live-stock from natural decay, accidents, &c., has been resumed.

27. *Cattle disease.*—The subjoined table compares the mortality reported amongst live-stock during the year with that reported in the preceding year, and with the average for the five years ending in 1891–92:—

Causes of death.	Number amongst cattle.			Number amongst sheep and goats.			Number amongst horses and ponies.		
	Average up to 1891–92.	In 1891–92.	In 1892–93.	Average up to 1891–92.	In 1891–92.	In 1892–93.	Average up to 1891–92.	In 1891–92.	In 1892–93.
Diseases—									
Rinderpest	56,587	10,359	13,104	3,551	1,837	2,099	..	..	..
Diarrhœa and dysentery ..	25,716	18,394	32,812	3,563	2,714	5,777	7	7	22
Total ..	82,303	28,753	45,916	7,115	4,551	7,876	7	7	22
Anthrax	22,440	16,788	15,855	4,065	4,391	5,893	10	17	15
Foot-and-mouth disease ..	5,611	6,157	6,659	1,564	2,857	571	..	..	..
Variola	2,317	2,508	2,348	6,555	5,899	2,258	3	1	..
All others	25,009	33,143	31,212	10,154	13,740	15,553	109	130	105
Total from disease ..	137,680	87,349	101,990	29,452	31,438	32,151	129	155	142
Other causes—									
Snake-bite	2,351	1,751	1,780	199	153	184	7	7	6
Wild-animals	9,670	10,188	9,152	6,777	5,942	5,019	108	142	160
Criminal poisoning	37	18	20	5	..	..	..	..	..
Total from other causes ..	12,058	11,957	10,952	6,981	6,095	5,203	115	149	166
Grand Total ..	149,738	99,306	112,942	36,433	37,533	37,354	244	304	308

The total loss of cattle from disease was slightly higher than in 1891–92, but was very considerably below the average. The increase is shown under rinderpest, and diarrhœa and dysentery; that under the latter head accounting for nearly the whole of the gross increase. It occurred chiefly in the Kistna district, where 20,351 deaths (out of a total of 32,812 for the whole Presidency) were attributed to these two diseases, against 2,522 in 1891–92 and an average of about 1,500 during recent years. In the same district and in the adjoining district of Kurnool there was a

considerable excess in the number of deaths put down to rinderpest; the total from these two districts more than accounting for the gross excess (2,745) over the previous year in the Presidency. It may be noted, however, that speaking generally there were more deaths reported, as due to rinderpest, diarrhœa and dysentery taken together, in the northern half of the Presidency, and fewer in the southern half than in the preceding year. Otherwise than in the case of the diseases above mentioned, wherein the chief excess loss was very much localized, the loss from disease amongst the horned stock was less than in the preceding year; but there was a material increase over the average in the losses put down to unspecified diseases. This may be in part attributed to the gradual improvement of registration, and is a feature noticeable also in the case of the deaths reported amongst the sheep and goats, which otherwise do not present any special feature, except as showing the comparative absence of foot-and-mouth disease amongst our flocks. The deaths amongst horses and ponies from disease were reported at only 142.

28. The next table compares the rate of loss from disease as reported for each description of stock during the last six years:—

Year.	Horned cattle.			Sheep and goats.			Horses and ponies.		
	Number of		Death-rate per mille.	Number of		Death-rate per mille.	Number of		Death-rate per mille.
	Stock.*	Deaths.		Stock.*	Deaths.		Stock.*	Deaths.	
1887-88 ..	11,523	174,223	15·1	9,575	16,969	1 8	35	39	1·1
1888-89 ..	13,699	196,264	14·0	11,390	29,279	2·6	39	99	2·5
1889-90 ..	14,476	128,466	8·9	12,061	39,599	3·3	43	153	3·5
1890-91 ..	14,959	102,097	6·8	12,467	29,977	2·4	43	199	4·6
1891-92 ..	14,849	87,349	5·9	12,715	31,438	2·5	42	155	3·7
Average ..	13,901	137,680	10·1	11,641	29,452	2·5	40	129	3·2
1892-93 ..	† 14,342	101,990	7·1	† 13,197	32,151	2·4	† 40	142	3·5

* Thousands. † Approximate figures only; returns incomplete.

The total number of deaths from disease amongst cattle was less than in any of the preceding five years except 1891–92, when the losses were exceptionally small, and the death-rate was very much below the average. Amongst the sheep and goats the death-rate was also slightly below the average, whilst amongst horses and ponies it was slightly above the average.

29. The distribution of the deaths amongst cattle during the year presented the feature of varying from the average in that during the first three months of the year they increased very rapidly and then decreased in July; instead of, as usually, decreasing slowly up to June and then increasing considerably. From July onwards till September, there was an increased mortality reported as is generally the case, but in October, although there was a slight increase, it was not at all proportionate to the average. This was followed by a most unusually sharp decrease in the number of deaths reported during November and December, in which months the largest number of deaths from disease is generally found. Again in January the death-rate showed an unusual increase, but in the following months fell away to lowest monthly number for the year—6,635 in March 1893. These monthly fluctuations were due almost entirely to the variations from month to month in the number of deaths put down to rinderpest, diarrhœa and dysentery taken together; whilst the latter variations occurred chiefly in the deaths reported from Kistna, although during the last three months of the year they were influenced in no inconsiderable degree by the existence of rinderpest in Kurnool. The average fluctuations in past years are influenced greatly by the enormous mortality that occurred in the Carnatic districts during several years in the later months of the year.

30. The largest number of deaths put down to rinderpest were reported from South Arcot, Kistna and Kurnool, whilst in Ganjám and Cuddapah the number of deaths from this cause was considerable. Two-thirds of the deaths from diarrhœa

and dysentery were reported in Kistna, North Arcot, Chingleput, Gódávari and Ganjám alone, of the other district reporting upwards of 1,000 deaths each from this cause. Anthrax caused most deaths in North Arcot and Gódávari, but both in the Ganjám, Kistna, Cuddapah, Chingleput, Tanjore and Madura districts upwards of 1,000 deaths from the diseases so classed were reported. Nearly half the deaths from foot-and-mouth disease occurred in Ganjám; Chingleput and Malabar contributing the next largest numbers. Variola appears to have caused a large number of deaths in Kistna and a considerable number in Coimbatore, Madura and South Canara. Unspecified diseases as usual appear in largest numbers against Kurnool, but are said to have caused a large number of deaths in Kistna, Anantapur, Cuddapah, Chingleput, Coimbatore and Madura also. The total death-rate from disease was high only in Kistna and Ganjám, but was considerable also in Kurnool, Vizagapatam and Chingleput. It is intended that the Superintendent, Civil Veterinary Department, should deal with the history of cattle disease during the year fully in his annual report in another year.

31. Amongst the sheep and goats, the only districts reporting any considerable death-rate were Ganjám, Vizagapatam and Chingleput, and in the first named it may be exaggerated by defects in the stock returns. Of the death amongst the class of stock, nearly half appear under unspecified diseases, and over one-fifth of the latter were reported from Madura alone.

32. The deaths amongst horses and ponies from disease are chiefly reported from Kurnool, Cuddapah and Anantapur, and chiefly under unclassified diseases.

33. Losses from snake-bites and the ravages of wild animals were generally smaller than in 1891–92, but there was an increase in the death of cattle (due to criminal poisoning) from 18 to 20. The subjoined table shows the action taken in regard to each case of cattle-poisoning that was reported :—

District.	Number of cattle poisoned.	Action taken.
Ganjám	1	Two of the accused were fined Rs. 5 each, and the third was whipped.
Nellore	1	The two accused were sentenced to 1 and 2 months' rigorous imprisonment, respectively.
Anantapur	6	In three cases the accused were tried and discharged for want of evidence, in two others the culprits were sentenced to 3 and 6 months' rigorous imprisonment. As regards the sixth, the Chemical Examiner has reported that the intestines of the suspected animal contained no poison.
Chingleput	2	In one of the cases the two accused were sentenced to 4 months' rigorous imprisonment, the accused in the other was also sentenced to 4 months' rigorous imprisonment.
Salem	6	In one case the accused was sentenced to 4 months' rigorous imprisonment, and the conviction and sentence were upheld on appeal to the Deputy Magistrate; as regards the other five cases the Tahsildars concerned report that the offenders could not be traced.
Madura	3	In one of the cases the accused was sentenced to 4 months' rigorous imprisonment, and in the other two the offenders were not traced as no one would come forward to give evidence.
Malabar	1	The accused was discharged for want of evidence.

34. *Civil Veterinary Department.*—Early in the year, the appointment of a Superintendent of the newly organized Civil Veterinary Department to this Presidency was made; and Veterinary-Captain Burke, A.V.D., the officer selected, arrived in the Presidency on 27th April 1892. It was at first proposed to depute him to Poona to study in the Bacteriological Laboratory there, but this was not found possible, and he was directed to undertake the work of Veterinary Lecturer in the College of Agriculture temporarily, continuing to afford advice to the Board and Government in matters relating to pony-breeding. Most of this officer's time was given

to educational work, which does not fall within the scope of this report. On behalf of the Agricultural Department he paid brief visits to the North Arcot, Salem and Coimbatore districts during the year to report upon the prospects and progress of pony-breeding therein. His reports have been separately disposed of. Copy of Veterinary-Captain Burke's Annual report is appended.

At the commencement of the year, the Deputy Inspector of Cattle Diseases, Mr. Shunker, was on duty under the Collectors in supervising the pony-breeding operations in Salem and Coimbatore. This officer died in July last, and in him the Government lost a valuable and hard working officer. The name of the post was subsequently altered to "Deputy Superintendent, Civil Veterinary Department," and was filled up by the selection of Mr. Narrain Rao, the Veterinary Assistant in the College of Agriculture. He joined his appointment in November 1892 and remained on duty till March when he proceeded on one month's privilege leave. The work of these officers was entirely confined to pony-breeding; the results thereof are noted below.

At the beginning of the year 14 Stock Inspectors were on the list, and were then all employed on famine duty. With the close of relief operations most of them were brought to Madras, and there employed in the Board's office pending the issue of the orders of Government as to the future work to be undertaken by this branch of the department.

35. Shortly before the close of the year the Assistant to the Inspector-General, Civil Veterinary Department, was deputed by the Government of India to Madras to consult with the local officers as to the preparation of a plan for carrying out their wishes that the Superintendent, Civil Veterinary Department, in this Presidency should devote his time to the investigation of cattle disease. Proposals for giving effect to this were submitted to Government at the end of the year, and are still under consideration. Since then the Government of India has specified more definitely the questions to which the Superintendent should devote his attention, viz.—

(1) Whether rinderpest is confined to, or is more prevalent than elsewhere, in particular localities;

(2) Whether it has been hitherto, or can, under proper direction in future be, accurately diagnosed and distinguished from other diseases;

(3) Whether laboratory experiment is required to determine an accurate diagnosis;

(4) To what extent animals which have recovered are immune from future attacks;

(5) Whether there is likely to be any local objection to vaccination;

(6) Whether in any district or tract the people will, as in Burma, or some parts of the Central Provinces, co-operate in securing isolation;

(7) What are the conditions which are provocative of an epidemic;

(8) Whether any particular breeds of cattle are more subject to it than others.

The Superintendent has received instructions to collect information on these points from the reports of previous Veterinary officers, and by personal observation in this Presidency.

36. *Pony-breeding.*—These operations were confined to the Coimbatore and Salem districts,—three stallions having worked in the former and three in the latter district throughout the year, whilst a newly purchased stallion was sent to Salem in January last. Two stallions were sold at the beginning of the year, and another later on, whilst two were purchased during the year. One of the latter, however, died soon after his arrival in this Presidency. The work done by the stallions was satisfactory in both districts. The operations were placed under the supervision of the Superintendent, Civil Veterinary Department, during the year, and that officer inspected the stallions. He also visited the North Arcot district, and on his recommendation it was proposed to extend the operations to that district. The results of the coverings effected in 1891–92, reported during the year, were not satisfactory.

VII.—Miscellaneous.

37. No change was made during the year in the number or the dates of issue of crop forecasts which were all duly published on the dates shown in the subjoined statement; the form in which the final forecasts are issued was, however, slightly amplified by the Government of India :—

Crops.	Report.		
	Sowings.	Forecast (first).	Forecast (second).
Paddy	15th October	15th December ..	15th February.
Indigo	15th September ..	15th ,,	..
Gingelly—			
Early	15th August	1st November.	..
Late	1st January	15th April.	..
Cotton ..	15th August (First) ..	10th December ..	10th February.
	10th October (Second) ..		

38. The total *rail-borne trade* of the Presidency during 1892–93 was nearly 6 per cent. less than in the previous year and was about the same as that in 1890–91; but the value of the articles carried was greater than in these two years by 5 and 6 per cent., respectively. The subjoined statement gives the details of the last 5 years :—

Year.	Imports.		Exports.		Internal.		Total.	
	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.	In thousands of maunds.	In lakhs of rupees.
1888–89	2,918	359	3,684	316	22,773	1,717	29,376	2,392
1889–90	3,783	393	4,311	372	23,752	1,915	31,846	2,680
1890–91	5,353	443	4,306	370	26,983	2,026	36,642	2,839
1891–92	7,027	525	4,716	361	27,305	1,979	39,048	2,865
1892–93	7,257	555	5,399	416	24,109	2,044	36,765	3,015

39. The import and the export traffic showed an advance as compared with that of the previous year, but there was a great falling off in the local trade, and the total traffic was about 36·77 million maunds or 2·28 millions less than in 1891–92. The increase in value occurred under all the three heads.

The import traffic amounted to about 7·26 million maunds, of which one-half was grain; compared with that of the previous year, there was an increase of 230,000 maunds or 3 per cent. in volume and of 30 lakhs or 6 per cent. in value. The supply of grain from Mysore increased by 431,000 maunds, while that from the Nizam's territory fell off by about 320,000 maunds.

The exports to other provinces increased by 683,000 maunds or by nearly $14\frac{1}{2}$ per cent. in volume and by $12\frac{1}{2}$ per cent. in value over those of the previous year. The increase is almost wholly due to increased exports of coal and coke, of which 1,555,580 maunds were sent to Mysore during the year under report against 909,771 maunds in the previous year.

The large decrease in the volume of the local trade, amounting to 12 per cent., was due mainly to a falling off of 2·5 million maunds in the imports of stone and lime to Madras for the Harbour works. There was also a decrease of 720,000 maunds in the traffic in railway plant and of 608,000 maunds under grain and pulse, while the trade in coal and coke, metals, oil-seeds and provisions advanced slightly. The value of the local trade was 65 lakhs or 3 per cent. more than in the previous year.

40. The distribution of the total trade of the Presidency amongst the different blocks into which it is divided for purposes of registration is shown below :—

Blocks.	Imports. 1891–92. Foreign.	Internal.	Total. Amount.	Percentage.	1892–93. Foreign.	Internal.	Total. Amount.	Percentage.	Percentage—Increase or Decrease.
1	2	3	4	5	6	7	8	9	10
	MAUNDS.	MAUNDS.	MAUNDS.		MAUNDS.	MAUNDS.	MAUNDS.		
Sea-ports—									
Madras	1,246,327	7,155,630	8,401,957	24·5	1,210,085	4,933,465	6,143,550	19·6	— 26·8
Pondicherry ..	13,570	1,618,230	1,631,800	4·7	7,685	1,356,909	1,364,594	4·3	— 16·4
Negapatam ..	13,276	1,140,908	1,154,184	3·4	11,580	1,119,973	1,131,553	3·7	— 2·0
Tuticorin	16,007	1,041,674	1,057,681	3·1	20,539	1,062,599	1,083,138	3·5	+ 2·4
Calicut	31,761	448,629	480,390	1·4	16,214	544,265	560,479	1·8	+ 16·7
Ceded Districts and Kurnool	1,712,162	1,650,411	3,362,573	9·8	1,476,182	1,357,747	2,833,929	9·0	— 15·7
Nellore	38,986	269,500	308,486	·9	3,852	283,682	287,534	1·0	— 6·8
Chingleput and North Arcot	903,824	3,060,816	3,964,640	11·5	652,706	2,373,082	3,025,788	9·7	— 23·7
South Arcot, Tanjore and Trichinopoly ..	146,780	3,660,251	3,807,031	11·1	151,574	3,898,755	4,050,329	12·6	+ 6·4
Madura and Tinnevelly	41,899	4,023,748	4,065,647	11·8	419,375	4,524,989	4,944,364	15·8	+ 21·6
Salem, Coimbatore and Malabar	1,595,932	3,109,955	4,705,887	13·7	1,698,571	2,518,743	4,217,314	13·5	— 13·6
Kistna	1,267,043	125,008	1,392,051	4·1	1,588,860	135,580	1,724,440	5·5	+ 23·9
Total ..	7,027,507	27,304,760	34,332,267	100·0	7,257,223	24,109,789	31,367,012	100·0	— 8·6

Blocks.	Exports. 1891–92. Foreign.	Internal.	Total. Amount.	Percentage.	1892–93. Foreign.	Internal.	Total. Amount.	Percentage.	Percentage—Increase or Decrease.
	11	12	13	14	15	16	17	18	19
	MAUNDS.	MAUNDS.	MAUNDS.		MAUNDS.	MAUNDS.	MAUNDS.		
Sea-ports—									
Madras	2,053,213	3,757,119	5,810,332	18·1	2,669,913	3,593,719	6,263,632	21·2	+ 7·8
Pondicherry ..	8,675	170,144	178,819	·5	2,531	115,389	117,920	·4	— 34·1
Negapatam ..	1,515	1,398,193	1,399,708	4·4	1,450	1,639,309	1,640,759	5·6	+ 17·2
Tuticorin	234	1,361,309	1,361,543	4·3	848	1,782,239	1,783,087	6·0	+ 31·0
Calicut	180,216	970,728	1,150,944	3·6	88,610	948,250	1,036,860	3·5	— 9·9
Ceded Districts and Kurnool	482,894	2,028,329	2,511,223	7·8	521,955	1,601,698	2,123,653	7·2	— 15·4
Nellore	1,302	507,858	509,160	1·6	739	374,185	374,924	1·3	— 26·4
Chingleput and North Arcot	641,323	6,540,597	7,181,920	22·4	696,189	4,552,493	5,248,682	17·8	— 26·9
South Arcot, Tanjore and Trichinopoly.	89,690	6,451,702	6,541,392	20·4	161,868	5,051,036	5,212,904	17·6	— 20·3
Madura and Tinnevelly	5,052	1,769,018	1,774,070	5·6	7,840	1,699,357	1,707,197	5·8	— 3·8
Salem, Coimbatore and Malabar ..	875,934	2,002,021	2,877,955	9·0	757,041	2,357,167	3,114,208	10·6	+ 8·2
Kistna	376,464	347,742	724,206	2·3	490,292	394,947	885,239	3·0	+ 22·2
Total ..	4,716,512	27,304,760	32,021,272	100·0	5,399,276	24,109,789	29,509,065	100·0	— 7·8

There was an increase in the import and export trade of Kistna during the year which was due mainly to increased traffic in grain and pulse and in coal and coke. The falling off in the exports of Chingleput and North Arcot was due to less stone and lime having been sent to Madras than in the previous year; the other noticeable decreases in the trade of the remaining blocks are mostly due to diminished traffic in food-grains consequent on the improved character of the season and the diminution of the demand for food-grains from outside in the districts which were suffering from scarcity in 1891–92. Thus the three blocks comprising the Ceded Districts and Kurnool, Chingleput and North Arcot, and Salem, Coimbatore and Malabar, which include most of the affected tracts imported less food-grains than in the previous year, and the two first-named blocks, as well as Nellore, and South Arcot, Tanjore and Trichinopoly exported less.

41. *Road Traffic.*—In G.O., dated 1st November 1888, No. 754, sanction was granted for the registration of inter-provincial traffic at 7 stations on 7 roads and of local or internal traffic at 103 stations on 54 roads. The inter-provincial traffic on 6 roads has been recorded; and the returns of local traffic registered from 1888–89 to 1891–92 at 83 stations on 40 roads have already been published. During 1892–93 the internal trade on 14 roads was registered at 19 stations and the remaining road was taken up for inter-provincial traffic as shown in the following table :—

Districts.	Description of the road.	Registering stations.
	Inter-provincial.	
Vizagapatam	....	(1) *Gunupur*.
	Internal traffic.	
Nellore	Ongole to Kothapattam	(1) *Ongole*.
Salem	(33) Salem to Karúr *viâ* Námakkal ..	(1) *Námakkal*.
Coimbatore	(35) Trichinopoly to Palghat *viâ* Karúr, Kângayam, Palladam and Coimbatore.	(1) *Kángayam* at the junction with the road from the Kodimudi Railway station. (2) *Palladam* where the roads from Tiruppúr and Dhárápuram join it. (3) *Coimbatore* at the Noyel bridge where the Palghat and Pollachi roads separate.
	(36) Karúr to Pollachi *viâ* Dhárápuram and Udamalpet.	(1) Where the road branches off to Kángayam. (2) *Dharapuram* at the junction with the roads from Palni and Dindigul. (3) *Dharapuram* where the road to Udamalpet leaves. (4) *Pollachi* where the road from Udamalpet joins it.
Trichinopoly	(37) Villupuram to Trichinopoly	(1) Junction with the road from Atur and Perambalúr.
	(38) Atur to Trichinopoly	(1) The place near Turaiyúr where a branch road leads for Musiri.
	(39) Námakkal to Trichinopoly	(1) At Musiri where the road from Turaiyúr cuts it.
	(40) Trichinopoly to Jayankondasólapuram	(1) Jayankóndasolapuram.
	(49) Canal from Cannanore to South Canara.	(1) Sultan Tod.
Malabar	(50) Canal from Calicut to Badagara ..	(1) Payoli Lock.
	(51) Road from Periah ghat to the coast ..	(1) Kuttuparamba.
	(52) Road from Tamracheri ghat to Calicut.	(1) Malaparamba.
	(53) Road from Palghat to Cochin	(1) Mangalam.
	(54) Chávakkát-Chetwai-Trichur canal ..	(1) Canal entrance opposite to Chetwai bungalow.

All the trade returns are separately dealt with in detail in the annual report thereon.

APPENDIX I.

Letter from Veterinary-Captain R. W. BURKE, F.R.C.V.S., Superintendent, Civil Veterinary Department, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated Madras, 15th May 1893, No. 235.

I have the honour to submit a report of the work done during the first year's operations of the new Civil Veterinary Department in Madras.

2. On receiving orders on 16th April 1892 to report myself at Ootacamund, I at once took steps to do so, and arrived there on the 27th of April of that year. I found, however, upon reporting myself at head-quarters, that, though I had certainly acted on instructions, I had nevertheless reported myself at the wrong station. This was confirmed by the Assistant Adjutant-General of the station, who advised me accordingly to proceed to Madras.

3. On my arrival at the Presidency town (6th May 1892), I proceeded to report myself to the Revenue Board and found that I had done the right thing in coming to Madras. It appeared difficult and inconvenient, however, at that time to make immediate arrangements for me to take up veterinary service in connection with the Board, and it was proposed (Board's Resolution, No. 3571, dated 12th April 1892) that my appointment should be deferred until the officers who were occupied with famine affairs were relieved from their onerous duties, or until Government had settled the question of Farm schools. This proposal, however, not being sanctioned by Government (G.O., No. 2193, dated 29th April 1892, paragraph 1), I was told to await orders for transfer to Poona, where it was suggested that I should study for a period of six months with a view to perfecting myself in the study of Bacteriology. And I was to find, at the same time, a modified *virus* or preventive vaccine for "rinderpest, anthrax, and foot-and-mouth disease" (Board's Resolution, No. 4115, dated 4th May 1892). These matters will help to explain how it was that such a very considerable period elapsed before I was able to settle down fairly to work.

4. On 1st July, however, I received orders (G.O., No. 3082) to deliver a course of lectures on veterinary subjects under the Educational Department and as a part of the agricultural curriculum at Saidapet. Under ordinary circumstances I should consider this anything but a wise and economic arrangement in relation to training for veterinary service, but I was given to understand in the course of conversation with Messrs. Bliss and Clogstoun that, though required to lecture for a time, the arrangement was only temporary. One reason for this was that there was an alternative proposal to send me into the country districts (1) to acquire a knowledge of the various dialects of the vernacular or vernaculars, and (2) for inspection duty in relation to pony-breeding and rearing operations, and also (3) with a view, possibly, to the prevention and suppression of disease.

5. *Section I—Horse-breeding.*—The operations under this head will be separately reported on, on receipt of detail reports from the Collectors of Coimbatore and Salem. Some general remarks on the subject will be found at the end of this report.

6. *Section II—Mule-breeding.*—This is not carried on in this Presidency.

7. *Section III—Horse fairs and Horse shows.*—None were held during the year. Arrangements were made for holding a show at Hosúr in the Salem district, but it had to be postponed to 26th July 1893, with a view to give sufficient notice to the public. A show was held at Tirupúr in the Coimbatore district after the close of the official year, the results of which were extremely satisfactory.

8. *Section IV—Cattle disease, investigation and prevention.—Nil.* All preventive work has been given up in this Presidency and the question of investigation of disease is under the consideration of the local Government.

9. *Section V—Cattle-breeding, including fairs and shows.*—Cattle-breeding by Government is not carried on in this Presidency. Some local fairs are annually held, the most important being the Chittrai fair in Madura, the Subramania fair in Kulgunda in South Canara, the Tiruvannámalai fair in South Arcot, and the Mailar fair in the Bellary district. Only the Subramania fair was attended by a stock inspector, whose report was forwarded to the Board under this office No. 3, dated 2nd January 1893.

VETERINARY LECTURES AT AGRICULTURAL COLLEGE, SAIDAPET.

10. *Section VI—Veterinary instruction.*—I beg to state that at the Veterinary class at Saidapet, where I was sent on professional duty, I found, as I showed in my previous report to the Revenue Board (*vide* No. 136, dated 11th August 1892), (1) that the subordinate teaching staff was deficient for anything like the adequate training of veterinary subordinates for even elementary veterinary work of a practical kind. Possibly it was this fact that led the late Veterinary-Captain Symonds to remark, in relation to the establishment of a Veterinary school in Madras, that the scheme at once breaks down, because there is no teaching staff and that "candidates should have a *separate* and more comprehensive course of instruction" (*vide* Agricultural

Committee's Report, No. 805–88, dated 18th August 1888, and my No. 70, dated 14th February 1893). Inspecting Veterinary Surgeon Shaw also said (Agricultural Committee's Report of 1888, page 233) "that in no teaching school in Europe would a professional man be expected to take up so many subjects,—Anatomy, Physiology, Pathology, Materia Medica, and as many more allied subjects,—or, did he do so, he could not do justice to them." Be that as it may, however, I found (2) that the three lectures that could be arranged for every other day, and latterly two every week, I had to give so as not to interfere in any way with the work of the Agricultural College, and (3) that Saidapet being out of municipal limits and away from the busy urban thoroughfares there was not enough practice either in the treatment of constitutional disorders or surgical cases to properly illustrate our work, or to give the students any intelligible idea as to how to deal with cases in ordinary practice. There was a practical class for them at the Government Veterinary Hospital, Saidapet, from 6-30 to 8-30 A.M. daily.

(*A*) *Government Veterinary Hospital, Saidapet.*

11. In Board's Resolution No. 662, dated 1st February 1893, I was requested to "cause an increase of confidence in the work done there and to make efforts to induce villagers to resort to the Saidapet Veterinary Hospital." But although appointed to lecture at the Saidapet Agricultural College, the Government Veterinary Hospital there is not under my charge, but is placed immediately under the Principal of the Agricultural College, to which it is an appendage—*vide* this office No. 54, dated 3rd February 1893.

12. I am of opinion, therefore, that no more increase of confidence in the work done there will be shown than at present exists for the fact that it is not within municipal bounds and cattle cannot forcibly be admitted into the hospital there as they can under the S.P.C.A. rules in Madras. There are numerous private cases in Madras which are admitted into S.P.C.A. Infirmary and to the many private and public stables of Madras, and which help to reduce the general admission of cases into the Saidapet hospital. Moreover, the number of draught cattle of the Saidapet neighbourhood is much too small in proportion to the working cattle of Madras.

(*B*) *Session*, 1892–93.

13. Class II had 13 agricultural students. Lectures were given on Anatomy and Physiology—Veterinary Stage I. All these students and two from the senior class (class III) appeared for the examination.

14. Class III had 13 agricultural students. Lectures were given on Materia Medica, Veterinary Surgery and Medicine—Veterinary Stage II. All the students appeared for the examination.

15. I commenced to lecture at the opening of the Agricultural College in July 1892, and was assisted by Mr. Naraina Rao until the end of November 1892, when he was transferred to the pony-breeding operations, and Mr. D'Silva, 2nd Assistant, College of Agriculture, became the Veterinary Assistant.

16. In relation to the general results of the year's work, my experience at Saidapet leads me to the conclusion that no useful result can be attained under the present arrangements for veterinary education. This also was fully brought out in the two previous reports which I have had the honour to present during the year (No. 74, dated 25th May 1892, and No. 136 of 11th August 1892). * * * The question as to what work the Veterinary Department is expected to do in this Presidency is however still under the consideration of Government.

SOCIETY FOR THE PREVENTION OF CRUELTY TO ANIMALS.

17. In addition to the duties at Saidapet, I have had a good deal of instructing work during the year at the Infirmary of the Society for the Prevention of Cruelty to Animals. In accordance with G.O., No. 1316, dated 22nd July 1892, I have visited the Infirmary of the S.P.C.A. morning and evening for several months (*vide* report of the Madras S.P.C.A. for 1892–93, p. 13), treating sick cases and granting certificates of discharge, until, in fact, I was ordered into the districts on inspection duty in December last. I attended also the Police courts on the beach daily from 10-30 to 12 noon for the purpose of reporting on cases of sickness and hurt. The usefulness of this arrangement soon began to appear. For, while at the commencement of my professional duties the income of the Society amounted to only some Rs. 400 per mensem, the result of the permission accorded by Government was that in a few months the income rose to Rs. 1,200, and great numbers of sick and injured animals were relieved. All this had a distinct effect upon public opinion in the city, which has undoubtedly been rapidly growing in favour of the Society's work.

OFFICE WORK.

18. In relation to the clerical work of the department during the year, it has had in consequence of its tentative character to be carried on with some difficulty. The compilation of statistics of cattle mortality formerly done by the Revenue Board has devolved on my office in addition, of course, to the miscellaneous correspondence of the pony-breeding operations, Stock Inspectors and others attached to the department. When the work was formerly carried on under Veterinary-Captain Mills it was by the aid of certain probationers who on appointment to districts were unable to continue their labours. Veterinary-Captain Mills, therefore, requested that this

branch of the work should be done at the Board's office. So although Veterinary-Lieutenant Hazelton reviewed the statistical tables, the actual compilation of them was done by the Board.

19. In former times also it was customary to maintain a compounder and clerk on the staff of the Veterinary Department, who was a help to the office, and, under ordinary circumstances, it appears to me that there should still be one. Both clerical and professional duties, however, have fallen upon myself during the year.

20. Although prevention of cattle disease was suspended during the year, yet all the correspondence of the Stock Inspectors has passed through this office as before. My request for one Stock Inspector to help me in the compilation of cattle mortality reports and other extra work thrown upon this office during the year was refused by the Board, when all the Stock Inspectors of this department were engaged in the compilation of grain reports, &c., for the Agricultural and other departments under the Board.

21. The tentative and provisional character of the local appointments I have held during the year has seriously hampered all such work as I have been able to attempt. Records have had to be kept in one place, while clerical work requiring reference had to be carried on in another place some miles off. It was impossible to keep important records at Saidapet under my own eye, as the office there was marked "temporary," and it was repeatedly impressed upon me that it must be given up whenever it might be required for agricultural experiments. They had therefore to be kept for safety in a separate store-room at Chepauk, about five miles from Saidapet. The inconvenience of this arrangement has at times created serious difficulty. It has been since arranged that, during the vacation of the College at Saidapet, whilst I am under orders for the districts to inspect the Government stallions and attend pony fairs, that the above-mentioned arrangements will be held in suspension and accommodation will be found for me temporarily in the Board's office at Chepauk. I have also to thank the Board for another temporary allowance of an office-room for a few days on my arrival in Madras.

Conference.

22. Mr. Pease was sent here by the Government of India and a conference ordered by the Madras Government was held on the 10th March last, consisting of the Director of Agriculture, Mr. Pease and myself, and which was also joined by Mr. Benson. The chief points discussed and recommended by the Members of the Conference were briefly these: that the present number of Stock Inspectors should be utilized for veterinary work in the investigation of disease in four districts; (2) that they should undergo six months' instruction in contagious diseases in a Veterinary school under the Superintendent, Civil Veterinary Department, Madras; (3) that students should be raised for the other districts and to succeed those already engaged, and who should be also educated in a Veterinary school which the Government should provide; and (4) that the same methods of prevention of disease should be undertaken as those adopted by Burma and the Punjab. The details of the latter I need not repeat here.

23. The only warning necessary is that investigation in this country must not be regarded as of more importance than the immediate practical application of the scientific knowledge already available, so that the spread of disease may be prevented even though disease itself cannot be entirely prevented. "We look forward to a time when there will be a highly trained Stock Inspector with a staff of salustry subordinates in every taluk, when the sense of the country will be actively on the side of the preventive and curative staff, and when better stock-management will remove the predisposing causes of epizootics. We consider that the department should at once bend its efforts to obtain as quickly as possible a considerably strengthened staff of Stock Inspectors, whose education and training will fit them to deal confidently with disease"—*vide* Agricultural Committee's Report, No. 686, dated 25th September 1888, page 10.

Cattle Disease Prevention.

24 to 29. * * * * *

Pony-breeding Operations.

30. I find that the inducements held out by the Government to improve the stock and ponies in this Presidency have all along been very small. Indeed, it may now be stated to be practically *nil*, except that pony-breeding is carried on in Salem and Coimbatore, in which districts six stallions only are stationed and some country ponies have been castrated. This has been wholly insufficient to produce appreciable results.

31. On the other hand, attempts have been made to prove pony-breeding a failure in the Madras Presidency by endeavouring to show a small number of foals by Government stallions.

32. The percentage of succesful coverings for Salem district for the four years (1887–1891), viz., 33, compares favorably with Bombay (35) and is higher than Bengal (30), whilst that for Coimbatore district (19) is lower. Recent inquiries show that no sufficient inquiry was made in some cases before the results were reported.

33. Valuable results are already forthcoming in Salem and Coimbatore districts, yet their full value is not obtainable, because of the early sale of the foals and their removal to other districts, and because of the difficulties of inspection caused by certain religious beliefs. Much of this will be overcome as the department of pony-breeding develops into form and, with the facilities of inspection and common intercourse the fairs will eventually afford, will come those

new enticements which always spring up in such cases and which may fairly be included in our estimates of future results. There can be no doubt that the main direction in which for some years to come the indigenous breed of ponies will be susceptible of improvement lies in the increased supply of a better class of stallions and in the elimination of inferior sires.

34. The supervision of the pony-breeding branch of the department was made over to me in G.O., No. 848, dated 13th August 1892, and G.O., Mis No. 553, dated 8th February 1893.

35. The Board suggested in its Resolution, No. 5848, dated 8th July 1892, that the official title of the Deputy Inspector of Cattle Diseases should be made "Superintendent, Pony-breeding Operations," but the Government ruled that he should be subordinate to the Superintendent, Civil Veterinary Department, and be styled Deputy Superintendent, Civil Veterinary Department.

36. The first Deputy Inspector, Mr. Shunker, having died on 27th July 1892, his place was filled on 28th November 1892 by Mr. Naraina Rao, my only Assistant at the Saidapet Agricultural College whose post was given to Mr. D'Silva, a graduate of that College.

37. In my first discussion with Messrs. Bliss and Clogstoun, I pointed out the experience and special qualifications of Mr. Naraina Rao as a teacher, and it was resolved he should not be permitted to leave the Saidapet College. But in order to enlarge the educational staff of the Agricultural College, it was afterwards ruled by the Board that he should be transferred to the pony-breeding operations.

38. I inspected the district of North Arcot in the month of December 1892 to report on the question of increasing pony-breeding in that district—*vide* my report No. 266, dated 17th March 1892. The Government were pleased to sanction the purchase of two stallions for that district from the funds of the next official year 1893–94, and also another stallion to replace casualties in the other districts.

39. One stallion, *Ali Bábá*, of the Salem district was reported unsound by Veterinary-Major Adams and sold in September last. Two stallions, viz., *Carbon* and *Diamond*, were purchased during the year, of which one animal, *Diamond*, died shortly after purchase, leaving a total of seven stallions; and one stallion, *Jack*, has since been sold, being found unfit for further service. There now remains a total of six stallions.

40. In consequence of the Board having ordered that only stallions possessing certain markings shall be purchased, I regret to say that the three stallions, the purchase of which has been ordered by Government, cannot now be procured until next cold season.

41. Salem and Coimbatore districts were visited by me in the months of February and March last to report on the result of the pony-breeding of the Presidency carried on in these districts—*vide* my report No. 148, dated 4th April 1893.

42. All the correspondence relating to this branch of the department passes through this office to the Board, and the monthly statement of mares covered and a statement giving particulars regarding the employment of the Deputy Superintendent during the month are also prepared by the Veterinary office.

43. Before closing my report on pony-breeding operations, I should like to lay emphasis on the improvement which has taken place in those ponies got by Government stallions. They are always bought up eagerly by the better class of natives, and, in many cases, are taken away by them to other districts. But it must be remembered that the employment of Government stallion is of such a recent date that only partial results can be seen as yet. It is only when the mares got by Government stallions out of country-bred mares themselves produce foals by such sires, that the more marked improvement can be seen. Country-bred tats cannot become Arab ponies in a few years even though Government stallions be used. Improvement has taken place, and will undoubtedly continue to take place. Indeed it is our very success that constitutes one of our chief difficulties. As we have said, the ponies got by Government stallions are at once bought up and very often are never used for breeding.

44. I am much indebted to the members of the Revenue Board for the interest, encouragement and sympathy in connection with the varied difficulties involved in launching the work of the new department, and now that the danger of famine is past for the present, and public funds are set free for other important claims and for more general use, I feel assured that Government will in its wisdom extend the useful work of the Veterinary Department in this Presidency.

STRENGTH of the Civil Veterinary Department during the official year 1892–93.

Superintendent	1
Deputy Superintendent*	1
Stock Inspectors (*vide* appendix No. 2)	14
Clerk	1
Peons	3
Total ..	20

* *Vide* G.O., dated 13th August 1892, No. 848, embodied in Board's Proceedings, dated 5th Sept. 1892, No. 623.

The Deputy Superintendent is employed temporarily in the pony-breeding operations.

All the Stock Inspectors have been engaged by the Board during the year. Only one man attended me during the pony inspections on each occasion, and another was ordered to attend the cattle fair of South Canara in the month of November. The Stock Inspectors applied for permission as Veterinary Assistants to be withdrawn from other duty (G.O., dated 29th April 1892, No. 2193) and to be allowed to attend a further course of lectures at Saidapet and to be engaged on some work in connection with the Veterinary Department (G.O., dated 24th March 1891, No. 236, paragraph 5), but this could not be granted to them, and they are still on spare agricultural duty.

The service books of the establishment have been brought up to date and verified.

STATEMENT showing the work done by Stock Inspectors during the official year 1892–93.

Name.	Nature of work done.			Remarks.
	On famine duty.	Board's office.	Veterinary work.	
	Kurnool district.			
1. P. Raghava Pillai ..	April 1892 to 1893.	....	....	Died. On leave 26th March 1893.
	North Arcot.			
2. K. Padmanabhayya ..	8th May to 26th July 1892, 12th December 1892 to 31st March 1893.	27th July to 3rd December 1892.	Pony-breeding operations, 4th to 11th December 1892.	On sick leave from 8th February 1891 to 7th May 1892.
	Kurnool.			
3. M. Venkatramana Sastry	April 1892 to 31st March 1893.	....	....	....
	Cuddapah and Nellore.			
4. A. Canthayya Mudaliar.	1st April to 18th September 1892.	19th September to 25th October 1892.	....	On sick leave from 26th October 1892 to 30th April 1893.
		....	Cattle fair, South Canara, 3rd November to 5th December 1892.	
	Bellary.			
5. B. K. Santayya ..	1st April to 2nd November 1892.	6th December 1892 to 24th February 1893, 4th to 17th March 1893.	Pony-breeding operations, 25th February to 3rd March 1893, 18th to 29th March 1893.	
	Bellary.			
6. K. Sethu Row	1st April to 4th November 1892.	5th November 1892 to 31st March 1893.	....	....
	Anantapur.			
7. C. Viswanatha Aiyar ..	18th April to 8th July 1892.	9th August 1892 to 31st March 1893.	....	Sick leave from 18th March to 17th April 1892. Under suspension from 9th July to 8th August 1892.
	Salem.			
8. V. P. Subramania Mudaliar.	1st April to 21st September 1892.	22nd to 26th September 1892.	....	On privilege leave from 27th September to 9th December 1892.
	Bellary.			
9. V. Seethamber Devu ..	1st April to 2nd November 1892.	3rd November 1892 to 31st March 1893.	....	....
10. G. Rungiah Naidu ..	1st April to 7th October 1892.	23rd November 1892 to 31st March 1893.	....	On privilege leave from 8th October to 22nd November 1892.
	Cuddapah and Nellore.			
11. M. Hassain Ali	1st April to 22nd September 1892.	23rd September to 6th November 1892, 7th February to 3rd March 1893.	....	On privilege leave from 7th November 1892 to 6th February 1893.

Statement showing the work done by Stock Inspectors during the official year 1892-93—*cont.*

Name.	Nature of work done.			Remarks.
	On famine duty.	Board's office.	Veterinary work.	
	Anantapur and Kurnool.			
12. V. Chockalingam Pillai.	April to 18th July 1892.	19th July 1892 to 31st March 1893.	....	....
	Anantapur and Nellore.			
13. R. Kanniah Naidu ..	April to 25th September 1892.	26th September 1892 to 31st March 1893.	....	....
	Chingleput and Salem.			
14. Moses Abraham ..	11th April to 28th May 1892, 21st June to 25th September 1892.	26th September 1892 to 31st March 1893.	....	On sick leave from 2nd March to 10th April 1892 and from 29th May to 30th June 1892.

STATEMENT showing the actual charges incurred during the official year 1892-93.

—	Pay.	Travelling allowance.	Total.
	Rs.	Rs.	Rs.
Superintendent, Civil Veterinary Department ..	9,040	171	9,719
House-rent	508		
Stock Inspectors (14)	11,507	1,684	13,191
Office establishment (1 clerk and 3 peons) ..	655	47	702
Office contingent charges	..	..	195
Total ..	..	..	23,807

Resolution of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 15th July 1893, No. 296, on the above.

The Superintendent's annual administration report will be recorded, pending the preparation of the annual report of the Department of Land Records and Agriculture, with the following remarks.

2. *Paragraphs* 10 *and* 16 appear to have been written under a mistaken conception of the purposes for which the present course in veterinary matters at Saidapet is intended; as noted in paragraph 4 it merely forms part of the Agricultural curriculum and is not designed for the training of veterinary subordinates. The reference made in the last-mentioned paragraph to certain demi-official correspondence with Mr. Grigg, as well as the copy of the note alluded to, will be omitted under G.O., dated 18th August 1891, No. 515, Political.

Paragraphs 24—29 are out of place in an administration report dealing with the work of the year of which cattle disease prevention formed no part and will also be omitted.

Paragraph 40 is inaccurate, as the Board's order was merely that, as far as possible, the opinions of the people regarding hair markings should be borne in mind in purchasing stallions.

3. The Superintendent should expedite the submission of the reports on pony-breeding operations and the review of the statistics of the cattle mortality (Board's Proceedings, dated 21st January 1893, No. 358) for the past year.

(True Copies and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

APPENDIX II.

MONTHLY statistics of mortality among cattle in the Madras Presidency during the year 1892–93.

Months.	Number of deaths due to disease.							Other causes.				Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Snake-bite.	Poisoning.	Wild animals.	Total.	
April 1892 ..	799	1,571	900	383	196	3,035	6,884	115	3	583	701	7,585
May ,, ..	1,010	1,754	988	592	242	3,355	7,941	107	1	621	729	8,670
June ,, ..	682	1,831	1,145	563	123	4,424	8,768	122	2	753	877	9,645
July ,, ..	703	2,306	1,413	463	288	3,090	8,263	130	1	804	935	9,198
August ,, ..	887	3,144	1,416	809	207	2,468	8,931	147	2	710	859	9,790
September ,, ..	998	4,574	1,566	564	158	1,990	9,850	187	1	797	985	10,835
October ,, ..	1,228	3,697	1,682	836	335	2,619	10,397	231	..	887	1,118	11,515
November ,, ..	1,352	3,289	1,408	575	338	2,331	9,293	230	5	834	1,069	10,362
December ,, ..	987	2,905	1,413	487	133	2,273	8,198	173	4	934	1,111	9,309
January 1893 ..	1,548	4,217	1,177	489	128	2,067	9,626	133	.	846	979	10,605
February ,, ..	1,263	2,048	1,408	414	139	1,929	7,201	109	1	638	748	7,949
March ,, ..	1,647	1,476	1,339	484	61	1,631	6,638	96	..	745	841	7,479
* Total ..	13,104	32,812	15,855	6,659	2,348	31,212	101,990	1,780	20	9,152	10,952	112,942

* Includes figures for some zemindaris in Vizagapatam.

MONTHLY statistics of mortality reported among sheep and goats in the Presidency of Madras during the year 1892–93.

Months.	Number of deaths due to disease.							Other causes.			Total from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other causes.	Total.	Snake-bite.	Wild animals.	Total.	
April 1892	74	653	141	3	106	736	1,713	7	322	329	2,042
May ,, ...	23	79	726	10	27	1,131	1,996	8	264	272	2,268
June ,, ...	10	163	298	28	185	2,196	2,880	24	463	487	3,367
July ,, ...	173	566	767	34	61	1,504	3,105	12	331	343	3,448
August ,, ...	304	311	376	34	65	1,285	2,375	6	476	482	2,857
September ,, ...	67	742	289	89	116	702	2,005	13	407	420	2,425
October ,, ...	333	573	589	89	280	2,170	4,034	13	671	684	4,718
November ,, ...	426	771	482	31	331	1,298	3,339	18	488	506	3,845
December ,, ...	270	201	1,045	43	343	1,056	2,958	19	423	442	3,400
January 1893	89	681	814	42	321	1,013	2,990	16	397	413	3,403
February ,, ...	134	846	183	65	325	710	2,263	22	299	321	2,584
March ,, ...	196	191	153	103	98	1,752	2,493	26	478	504	2,997
† Total ..	2,099	5,777	5,893	571	2,258	15,553	32,151	184	5,019	5,203	37,354

† Includes zemindari figures for Vizagapatam.

Statistics of mortality among cattle reported in the Presidency of Madras during the year 1892–93.

Districts.	Total stock in hundreds.	Deaths due to disease.						Total.		Deaths due to other causes.				Total deaths from all causes.	
		Rinderpest.	Drrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
1. Ganjám	334,6	1,154	1,153	1,460	3,284	14	629	7,694	23	29	56	1	86	7,780	23
2. Vizagapatam *	123,0	142	791	223	54	94	641	1,945	16	19	53	..	72	2,017	16
3. Gódávari	780,4	96	1,450	2,134	162	5	1,717	5,564	7	92	399	..	491	6,055	8
4. Kistna	1,115,3	2,031	20,351	1,673	196	1,278	2,863	28,392	25	102	162	..	264	28,656	26
5. Kurnool	632,4	2,023	757	558	135	41	7,841	11,355	17	64	382	..	446	11,801	19
6. Bellary	495,8	286	140	287	152	6	1,185	2,056	4	12	197	..	209	2,265	5
7. Anantapur	543,8	211	129	123	148	..	2,348	2,959	5	19	107	6	132	3,091	6
8. Cuddapah	898,8	877	890	1,251	146	83	1,850	5,097	6	50	478	..	528	5,625	6
9. Nellore	673,8	302	220	180	10	44	932	1,688	3	29	67	1	97	1,785	3
10. Chingleput †	461,7	540	1,045	1,369	566	56	2,140	5,716	12	577	20	2	599	6,315	14
11. South Arcot	1,111,7	2,830	379	768	61	24	861	4,923	4	89	33	..	122	5,045	5
12. North Arcot	851,4	362	1,866	2,460	298	..	143	5,129	6	179	619	..	798	5,927	7
13. Salem	907,7	179	766	124	66	86	796	2,017	2	43	311	6	360	2,377	3
14. Coimbatore	1,106,3	192	731	329	266	255	2,418	4,191	4	106	786	..	892	5,083	5
15. Trichinopoly	646,2	167	228	329	168	59	814	1,765	3	57	60	..	117	1,882	3
16. Tanjore	812,0	314	182	1,334	182	..	236	2,248	3	92	3	..	95	2,343	3
17. Madura	649,8	112	966	1,001	243	145	3,165	5,632	9	160	433	3	596	6,228	10
18. Tinnevelly	508,2	56	97	40	..	7	187	387	1	39	34	..	73	460	1
19. Nilgiris	68,1	411	1	..	..	..	45	457	7	8	410	..	418	875	13
20. Malabar	921,5	175	358	26	484	6	230	1,279	1	..	1,923	1	1,924	3,203	3
21. South Canara	700,3	644	312	186	38	145	171	1,496	2	14	2,619	..	2,633	4,129	6
Total ..	14,342,8	13,104	32,812	15,855	6,659	2,348	31,212	101,990	7·11	1,780	9,152	20	10,952	112,942	7·87

* Includes figures for some zemindari in Vizagapatam.

† Includes inam and zemindari figures for Chingleput.

STATISTICS of mortality among sheep and goats reported in the Presidency of Madras during the year 1892–93.

Districts.	Total stock in hundreds.	Deaths due to disease.								Deaths due to other causes.			Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola sheep-pox.	All other diseases.	Total. Number.	Total. Rate per mille.	Snake-bite.	Wild animals.	Total.	Number.	Rate per mille.
1. Ganjám	90,4	36	1,049	315	125	4	17	1,546	17	..	16	16	1,562	17
2. Vizagapatam *	51,4	20	285	55	..	..	80	440	9	..	26	26	466	9
3. Gódávari	140,4	20	207	118	6	146	528	1,025	7	4	76	80	1,105	8
4. Kistna	532,5	163	1,217	138	..	56	977	2,551	5	2	309	311	2,862	5
5. Kurnool	586,8	6	1,101	361	21	4	1,685	3,178	5	14	237	251	3,429	6
6. Bellary	536,4	1	58	684	26	108	439	1,316	2	..	110	110	1,426	3
7. Anantapur	1,065,1	66	203	910	8	456	2,755	4,398	4	..	293	293	4,691	4
8. Cuddapah	1,356,3	253	311	952	34	232	891	2,673	2	3	1,391	1,394	4,067	3
9. Nellore	620,4	30	91	23	..	4	417	565	1	2	57	59	624	1
10. Chingleput †	232,9	343	344	640	90	166	724	2,307	10	45	215	260	2,567	11
11. South Arcot	1,147,2	507	4	24	..	3	174	712	1	7	13	20	732	1
12. North Arcot	779,9	380	149	820	2	507	..	1,858	2	6	340	346	2,204	3
13. Salem	1,220,0	127	108	194	..	29	566	1,024	1	3	329	332	1,356	1
14. Coimbatore	1,383,2	60	170	244	20	186	2,059	2,739	2	23	631	654	3,393	2
15. Trichinopoly	1,203,1	27	8	110	29	47	603	824	1	12	198	210	1,034	1
16. Tanjore	548,2	6	3	26	2	26	70	133	..	2	18	20	153	..
17. Madura	712,1	38	403	202	118	97	3,440	4,298	6	55	304	359	4,657	7
18. Tinnevelly	907,1	10	50	76	90	179	110	515	1	5	265	270	785	1
19. Nilgiris	7,1	6	..	..	..	..	3	9	1	1	20	21	30	4
20. Malabar	66,5	..	16	1	..	8	15	40	1	..	142	142	182	3
21. South Canara	10,5	..	..	..	..	..	..	..	..	..	29	29	29	3
Total ..	13,197,5	2,099	5,777	5,893	571	2,253	15,553	32,151	2·44	184	5,019	5,203	37,354	2·83

* Includes zemindari figures for Vizagapatam.

† Includes inam and zemindari figures for Chingleput.

STATISTICS of mortality reported among Horses and Ponies in the Presidency of Madras during the year 1892–93.

Districts.	Total stock in hundreds.	Deaths due to disease.					Deaths due to other causes.			Total deaths from all causes.	
		Anthrax.	Diarrhœa and dysentery.	All other diseases.	Total. Number.	Total. Rate per mille.	Snake-bite.	Wild animals.	Total.	Number.	Rate per mille.
1. Ganjám	2	5	..	1	6	30	..	4	4	10	50
2. Vizagapatam *	1	..	1	..	1	10	..	..	..	1	10
3. Gódávari	19	1	..	2	3	2	..	2	2	5	3
4. Kistna	39	5	2	6	13	3	..	11	11	24	6
5. Kurnool	34	3	1	36	40	12	..	17	17	57	17
6. Bellary	36	1	..	9	10	3	..	15	15	25	7
7. Anantapur	25	..	15	8	23	9	..	7	7	30	12
8. Cuddapah	17	..	..	21	21	12	..	10	10	31	18
9. Nellore	12	..	..	..	..	..	..	1	1	1	1
10. Chingleput	8	..	2	8	10	13	3	..	3	13	17
11. South Arcot	31	..	..	..	..	..	2	2	4	4	1
12. North Arcot	18	..	..	..	..	..	..	1	1	1	1
13. Salem	32	..	..	1	1	..	..	6	6	7	2
14. Coimbatore	49	..	..	5	5	1	..	8	8	13	3
15. Trichinopoly	8	..	..	2	2	2	..	..	..	2	2
16. Tanjore	11	..	1	2	3	3	..	..	..	3	3
17. Madura	30	..	..	4	4	1	1	58	59	63	21
18. Tinnevelly	5	..	..	..	..	..	..	..	..	..	..
19. Nilgiris	15	..	..	..	..	..	..	16	16	16	11
20. Malabar	9	..	..	..	..	..	..	1	1	1	1
21. South Canara	2	..	..	..	..	..	..	1	1	1	5
Total ..	403	15	22	105	142	3·52	6	160	166	308	7·64

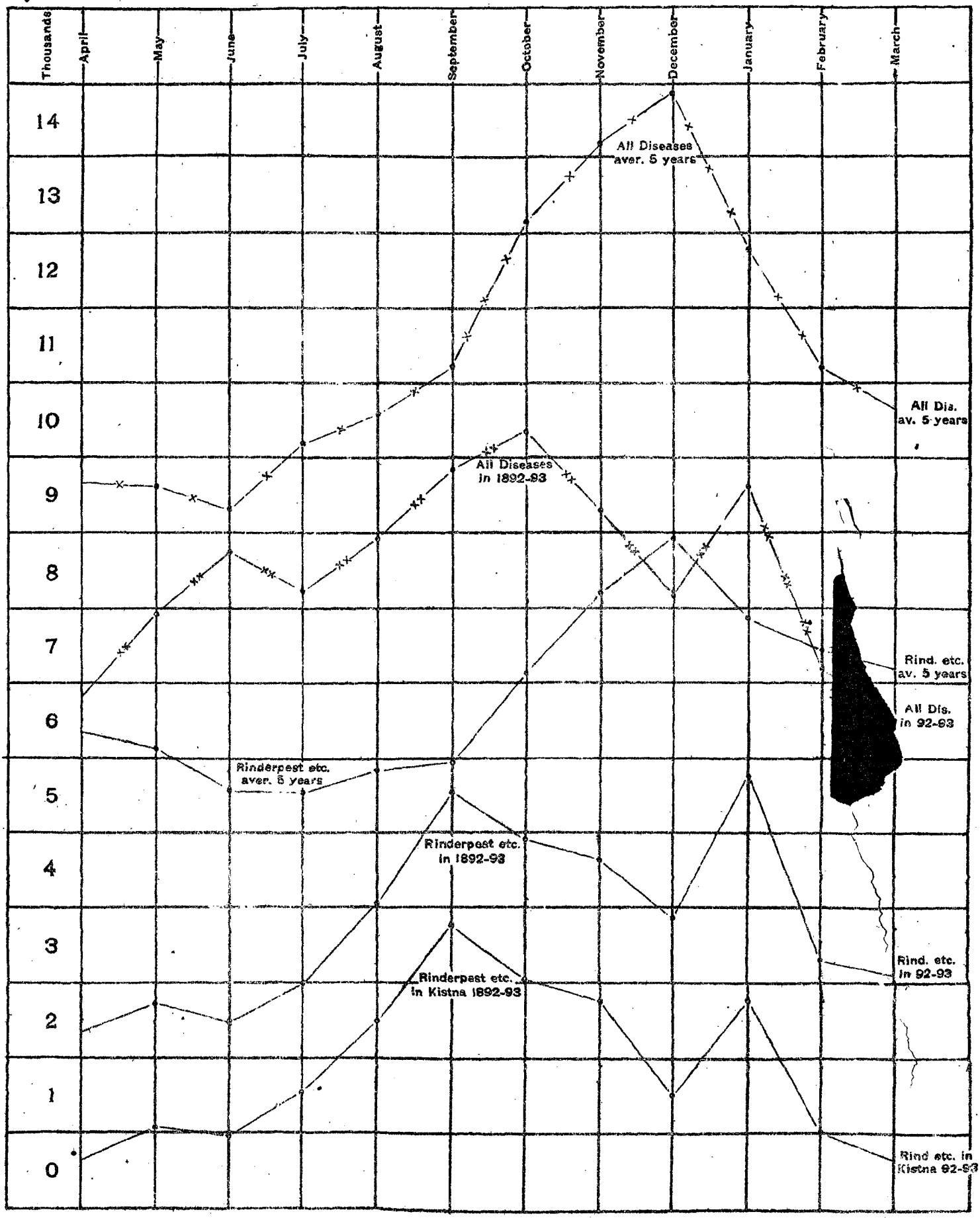
* Includes the zemindari figures for Vizagapatam.

MONTHLY statistics of mortality among Horses and Ponies in the Madras Presidency during 1892–93.

Months.	Due to disease.				Other causes.			Total from all causes.
	Diarrhœa and dysentery.	Anthrax.	All other diseases.	Total.	Snake-bite.	Wild animals.	Total.	
April 1892	1	..	20	21	..	15	15	36
May ,, ...	..	5	7	12	1	9	10	22
June ,, ...	..	1	12	13	..	16	16	29
July ,, ...	..	5	12	17	..	10	10	27
August ,, ...	..	..	8	8	..	16	16	24
September ,, ...	2	..	7	9	2	12	14	23
October ,, ...	18	1	6	25	.	16	16	41
November ,, ...	1	..	2	3	1	15	16	19
December ,, ...	..	2	4	6	..	14	14	20
January 1893	..	..	3	3	2	14	16	19
February ,, ...	..	1	22	23	..	11	11	34
March ,, ...	..	..	2	2	..	12	12	14
† Total ..	22	15	105	142	6	160	166	308

† Includes the zemindari figures for Vizagapatam.

MONTHLY MORTALITY AMONGST CATTLE IN 1892-93 COMPARED (WITH THE AVERAGE)



Reg: No. 1045 — Copies 750+140+100

Photo.-Zinco., Survey Office Madras
1893

Resolution—dated 26th September 1893, No. 394.

The Board resolves to submit the accompanying report on the operations of the Department of Land Records and Agriculture during 1892–93 for the information of Government.

2. The Director of the Department, Mr. Clogstoun, was on duty throughout the year, but during the early months, owing to the pressure of famine relief operations of which he had charge, the ordinary duties of the appointment were discharged by one of the Land Revenue Commissioners.

The Deputy Director, Agricultural Branch, was, for the greater part of the year, employed as Secretary to the Director in Famine Work; and also performed general Secretariat duties in his branch.

The Deputy Director, Land Records Branch, was on tour during the first nine months of the year, and for the remainder was engaged at head-quarters in formulating detailed instructions which his inspections showed were necessary on various matters.

(A true Copy and Extract.)

(Signed) M. ADINARAYANA IYAH,
Acting Secretary.

Order—dated 25th October 1893, No. 934, Revenue.

Miscellaneous.

With its Proceedings read above, the Board of Revenue submits its report on the operations of the Department of Land Records and Agriculture for the year 1892–93. A report from Veterinary Captain Burke on the work done by the Civil Veterinary Department during the year is also appended.

2. The Board's report was due in the Government office on the 1st of September, but was received only on the 6th of October, or more than a month after the prescribed date. The Board has not explained the cause of this delay, and His Excellency the Governor in Council is constrained to reiterate the remark made in reviewing the report of the Settlement Department for 1892–93 to the effect that this unpunctuality on the part of the Board in the Department of Revenue Settlement, Land Records and Agriculture is extremely unsatisfactory.

3. *Land Records.*—During the first part of the year under review the Deputy Director was engaged in touring, and the Government notes with satisfaction that, as a result of Mr. Wynch's inspections, the Board has been enabled to systematise the work of Revenue Inspectors. Mr. Wynch has since then been detained at head-quarters for various reasons, but has now started on a tour through the northern districts. The training of karnams in survey work was, at the suggestion of the Board and of the Superintendent, Revenue Survey, transferred in January last to the Survey Department. Nothing was done during the year under review, but shortly after its close a scheme was submitted by Mr. Cardozo for establishing schools for this purpose in six districts under the superintendence of a Deputy Superintendent of Survey, and this scheme received the approval of Government. Mr. Cardozo's report, since received, on the work turned out has been separately reviewed in G.O., No. 922, dated 21st October 1893, but it may be noted here that the results of the scheme of training have proved to be most satisfactory. The assistance rendered by the karnams in the re-survey of the Trichinopoly, Gódávari and Kistna districts and in the initial survey of certain other districts, which have not yet been settled, or where settlement is now in progress, has been already noticed by Government in reviewing the Administration Report of the Survey Department for 1892–93. The introduction of the Village Officers' Special Test Examinations alluded to in last year's review has been postponed till January

1st, 1896, partly on account of the unavoidable delay in the preparation of manuals containing the necessary information in the subjects in which Village Officers are to be examined.

4. As remarked by the Board, the progress made in the compilation of village registers of statistics and of firka books has not been satisfactory in some districts, and the Government notes that the special attention of the Deputy Director has been drawn to the great delay that has occurred in this matter in Ganjám. It is observed that the Board promises to complete the statistical atlas at an early date.

5. An Agricultural Conference has been recently held at Simla to discuss the various questions raised by Dr. Voelcker in his report on the improvement of agriculture in India, and until the recommendations made by this Conference, together with the orders of the Supreme Government thereon, have been received, the final decision in regard to several matters of the greatest importance cannot be arrived at by this Government. Dr. Voelcker's report has long been expected, and pending its receipt but little action was taken in the way of agricultural experiment. The scheme for the establishment of farm schools in this Presidency had also to be held in abeyance until this report was received. There is thus very little practical work to be recorded in the year under review. The Government, however, desires to be informed why no information is furnished, in the present report, on the subject of employing bones for manurial purposes as required by the Government of India in its circular communicated with G.O., Mis. No. 3922, dated 8th July 1891. It is not understood why Mr. Benson's services are still retained at head-quarters for Secretariat work. This question should form the subject of a special report.

6. *Veterinary Department.*—The most important event of the year was the inauguration of a Civil Veterinary Department under the control of a Superintendent in place of the Cattle Disease Department formerly existing in this Presidency. Details of the working of the department were not, however, decided upon before August last, and in the meantime Veterinary-Captain Burke, who had been appointed Superintendent early in the year under review, was engaged chiefly in delivering lectures in veterinary science at the Saidapet College of Agriculture, and in advising the Board on questions connected with horse-breeding and other connected matters. In the new programme of the work, sketched out in G.O., No. 756, dated 24th August 1893, the collection of information regarding cattle diseases and the stimulation of private enterprise in the direction of veterinary science by the provision of elementary education therein, are the chief objects aimed at. The Government has accordingly ordered that, as a preliminary measure, a special class under Veterinary-Captain Burke should be opened at Saidapet for the training of Stock Inspectors and in view to the eventual creation of a body of private practitioners.

7. The losses of live-stock during the year are fully reviewed in the Board's report. It is worthy of notice that although the total number of recorded deaths from disease and accidents among cattle (112,942) shows an increase on the corresponding figure of the previous year (99,306), it is still considerably below the average. This fact is remarkable when the sufferings of the cattle in many districts owing to the prolonged drought are remembered; and the Government fears that the loss from so-called natural causes must have been very heavy. The Government notes that steps have now been taken to renew the record of mortality from natural decay in accordance with the orders of Government.

8. In its letter communicated in G.O., Mis. No. 3464, dated 20th September 1893, the Government of India drew attention to the fact that these reports were not being prepared in accordance with the instructions contained in its Circular No. 52-G—69-6, dated 14th September 1887, which were to the effect that the executive work of the department should alone be recorded. The present report does not altogether comply with these orders, and His Excellency the Governor in Council moreover considers that several of the subjects now dealt with are out of place or unnecessary in a report on the Department of Land Records and Agriculture. For example, the Board now submits a special report on pony-breeding operations and the remarks on this subject by the Superintendent, Civil Veterinary Department, need not have been attached to

his present review. The Government of India's letter of 30th August was, however, received too late for any alteration to be made in the annual report of the present year, and the recommendations of the Simla Agricultural Conference must further be awaited before definite instructions are issued in regard to the preparation of future reports.

(True Extract.)

(Signed) E. GIBSON,
Ag. Secretary to Government.

No. 934A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) E. GIBSON,
Ag. Secretary to Government.

RESOLUTION—dated 23rd November 1893, No. 476.

Communicated to all Collectors, the Deputy Director, Land Records, and the Superintendent, Civil Veterinary Department.

2. With reference to the remarks made in paragraph 2 of the Government Order, the Board begs to point out that sections I to VI of the report were complete and ready for submission to Government at the end of August, but at that time it was not possible to embody in the report as usual the references to trade returns, paragraphs 38—41, nor had complete reports of the outturn of crops (*vide* paragraph 44 of the report for 1891–92) been submitted by Collectors when G.O., dated 20th September 1893, No. 3464, was received, and the report was delayed pending their receipt. As soon, however, as the above-quoted order reached the Board the report was submitted as it stands, all reference to the season, to relief operations, and to agricultural outturn being omitted.

3. No reference was made in the report to any action towards the utilization of bone manure in India—G.O., dated 8th July 1891, No. 3922—because none such in the way of experiment or otherwise was possible during the year.

4. The attention of the Superintendent, Civil Veterinary Department, will be drawn to the remarks of Government, made in paragraph 8 of the Government Order read above, regarding his annual report, and he will be instructed to omit any detailed remarks on the subject of pony-breeding from future Administration reports. In the same manner as a special report will, under G.O., dated 24th August 1893, No. 756, be hereafter submitted to the Director of Public Instruction on matters of Veterinary education, they need only be briefly alluded to in his annual report to the Board.

5. As soon as Mr. Benson has completed the special enquiry ordered in G.O., dated 13th November 1893, No. 4112, he will be directed to inspect the localities in which under G.O., dated 27th April 1892, No. 410, it is proposed to start the farm schools to which the Board proposes to depute the Agricultural Inspectors selected to take charge of them with a view to their perfecting their knowledge of local practice. The Simla Conference having unanimously recommended the extension of experimental farms in all Presidencies in accordance with Dr. Voelcker's recommendations, it is assumed that the consent of the Government of India to the establishment of these farms may shortly be expected.

(A true Copy and Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

(True Copy.)

(Signed) T. SUNDARA RAO,
Acting First Assistant.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1893-94.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1894.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1893-94.

I.—ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

During the official year 1893–94, Mr. Wynch was in charge of the office of the Deputy Director of Land Records up to 5th February 1894, on which date he was succeeded by Mr. Cobb. From 5th May to 27th June 1893, he held concurrently with his own appointment the post of Secretary to the Commissioner of Salt, Abkári and Separate Revenue.

2. With the exception of two short visits of inspection to Vellore and Saidapet in April and August, respectively, Mr. Wynch remained at head-quarters from April to the beginning of September, being engaged on miscellaneous duties in the Central office, viz., reviewing the reports from Collectors on the working of the Loans Acts and rules and the reports on record-arrangements in several districts; drafting revised instructions for the preparation of statistical returns and village registers of statistics, and for the conduct of jamabandi. He also revised the Settlement chapter in the Manual of Administration, and prepared a memorandum of work to be done by karnams after passing through their Survey training. From September to December, the Deputy Director was out on inspection tours in Nellore, Kistna and Gódávari. He made inquiries into the working of the revised form of Revenue Inspectors' diaries, inspected the taluk accounts in the taluks of Gudur, Nellore and Ellore, and in the Kistna district; made detailed inquiries as to the accuracy of the statistics of uncultivated portions of holdings in the Bezwada, Guntúr and Narasaraopet taluks; while in Gódávari, he also collected information required for the resettlement of the Western Delta. In December 1893, he was recalled to Madras in connection with the proposed revision of the rules and forms of accounts under the Loans Acts and remained at head-quarters with the Commissioner's permission till he handed over charge to Mr. Cobb.

Mr. Cobb remained at head-quarters till 28th February 1894, acquainting himself with the duties of his office. In March 1894, he went on a tour to Ganjám and inspected four taluk offices, paying special attention in the course of the tour to the state of the village registers of statistics.

3. In the nine districts noted on the margin, 5,604 karnams were trained during the year to demarcate, measure and map fields as laid down in Mr. Cardozo's Manual of Survey for Karnams, as well as to subdivide survey fields and to replace missing boundary stones. The average cost of training came to between Rs. 5 and 6 per head.

	Number of karnams trained.
1. Chingleput	690
2. South Arcot	1,461
3. Salem	878
4. Madura	481
5. Tinnevelly	713
6. Trichinopoly	813
7. South Canara	135
8. Malabar	427
9. Madras	6
Total ...	5,604

In order to keep the newly-trained karnams up to the mark, the Superintendent of Revenue Survey proposed to appoint in each of the first five districts mentioned above, a Head Surveyor to work under the orders of the Collector, and also suggested that Mr. Thornhill,

Deputy Superintendent, might be placed on special duty for the conduct of emergent resurveys and for the maintenance and correction of the village maps in these districts. These proposals received the sanction of Government. The karnams of the remaining 13 districts will be trained in 1894–95.

Vide G.O., dated 21st October 1893, No. 922.
" " " 4th December " " 1051.

4. Of the 619 Revenue Inspectors in the Presidency, 565 of those performing the duties of the post are reported to have undergone training in survey. Two of the posts were vacant at the end of the year, and six were held by old men drawing the old rates of pay ; and most of the remaining untrained men were acting incumbents.

5. Sanction was accorded for the resurvey of the whole of the Trichinopoly district and five taluks in each of the districts of Kistna, Gódávari and Salem. The services of the karnams (village accountants) were utilized to the fullest extent in carrying out these resurveys. The work was commenced in 1891–92 in Trichinopoly, in 1892–93 in Kistna and Gódávari and in the year under report in Salem. Of the aggregate area of 10,230 square miles to be resurveyed in all the four districts, 2,510 square miles were completed during the year and 5,777 up to the end of the year. The whole of Trichinopoly and three taluks of Kistna have now been completed, and survey is now in progress in the remaining taluks of Kistna and in all the five taluks of Gódávari and Salem. Up to the end of the year, however, maps were supplied only for 216 of the resurveyed villages in Kistna and 51 in Trichinopoly. Since the close of the year, they have been furnished for 107 villages more in the former and 180 more in the latter district as well as for 30 of the resurveyed villages in Gódávari.

II.—ANALYSIS OF DISTRICTS.

6. The compilation of village registers of statistics and firka books have been completed up to fasli 1301 (1891–92) in ten districts and nearly so in most of the others. The work remaining to be done is shown in the subjoined statement. In Trichinopoly, the progress has not been satisfactory :—

District.	Number of villages					Remarks.
	In the district.	For which village registers still remain to be		For which firka books still remain to be		
		Prepared for fasli 1301.	Checked for fasli 1301.	Prepared for fasli 1301.	Checked for fasli 1301.	
Ganjam	1,533	Completed.		Not begun in Berhampur.		
Vizagapatam ..	201	Completed.		Not begun in Sarvásidhi.		
Kistna	1,367	Information not reported for ten out of the thirteen taluks.				The registers have been completed in Bandur and Narasaraopet. In Repalle, village registers have been posted with the exception of section I.
Anantapur ..	973	3	3	5	5	
Tanjore	3,604	All villages in Pattukkottai.		All villages in Pattukkottai and Mannargudi.		
Trichinopoly ..	1,400	183	432	646	713	There are also arrears pertaining to faslis 1299 and 1300 in Musiri and Kulittalai. (1299: V.B. 4, F.B. 6; 1300: V.B. 16, F.B. 114)
Madura	896	4	4	Information not furnished.		
Tinnevelly ..	1,099	3	5	Completed.		
Nilgiris	36	Completed.		Information not furnished.		

Information as to the work pertaining to the accounts of fasli 1302 (1892–93) has not been received from all districts and will not be completely available until the receipt of the next Land Revenue Settlement reports in October next. The subjoined statement shows the work that has been done for fasli 1302 in the districts from which reports have as yet been received :—

District.	Number of villages					Remarks.
	In the district.	For which village registers have been		For which firka books have been		
		Prepared for fasli 1302.	Checked for fasli 1302.	Prepared for fasli 1302.	Checked for fasli 1302.	
Ganjám	1,533	All but 18 inam villages in Berhampur.		All villages except those in Berhampur.		
Gódávari	1,352	Completed.				
Kurnool	788	754	668	611	568	Firka books not yet begun in Pattikonda.
Bellary	985	884	874	..	..	
Anantapur	973	970	970	968	968	
Cuddapah	1,340	Completed.	..	Completed.	..	
Nellore	931	Do.	..	Do.	..	
Chingleput	1,785	Do.	..	..		
Tanjore	3,604	All villages in Negapatam.		..	..	
Tinnevelly	1,099	1,089	1,086	* 26 (firkas).	* 26 (firkas).	

* Out of 38 firkas.

The statistics will be found of great value in carrying out the revision of settlements in the Presidency—a work which is just commencing.

7. Reports on the economic condition of districts, based on a scrutiny of the figures compiled in the village registers of statistics, were received during the year from the Collectors of Vizagapatam, Anantapur, North Arcot, Nellore, Tanjore, Madura, Tinnevelly and Nilgiris. The reports continue to be of a very general character, but apart from any deductions to be drawn from the statistics of the village or of the firka, the annual tabulation of these vital and economic statistics in a comparative form and their annual examination by the Revenue officers of the district must tend to ensure their general accuracy and to enlarge and make more accurate the officer's knowledge of each portion of the country under his charge.

8. The statistical atlas is now complete for the whole Presidency with the exception of some detailed census figures and the letter-press has all been set up. The maps are in course of preparation and the atlas will be issued soon after the return of the Deputy Director of Agriculture from leave.

III.—COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

9. The revised kistbandi (instalments of revenue) sanctioned in 1889–90 continued in force during the year. In the case of North Arcot district, however, a temporary concession was granted in consideration of the effects of unfavorable seasons in the previous three years, and the ryots were permitted to pay up their revenue for the year in three instead of four instalments, the first instalment beginning a month later than before. In some taluks of this district, the ryots were allowed to pay in two instalments of 8 annas each, in February and March if they preferred to do so.

On a reference from Government, the question of a general revision of the instalments with reference to the period of harvests of different crops in different tracts came up for discussion. The Board, after consulting selected officers, was of opinion that the proposal was impracticable; but with a view to give further time to the ryots to sell their produce before being called on to meet the Government dues, it recommended that the December kist (instalment) should everywhere be abolished and that the revenue be made payable in three instalments throughout the Presidency, the first beginning in January in the Circars, the Deccan, the greater portion of the Central and in the Nilgiris and Malabar districts, and in February in the remaining districts. The instalments were to be of 4 annas each the first and third, while the second was to be an instalment of 8 annas. Before passing final orders, however, Government desired to have the opinion of Collectors as to the advisibility of having a kist (instalment) of 8 annas, and the reports of Collectors have been called for.

The system of allowing ryots to remit Government revenue by Postal Money order which had been tried as a tentative measure was found to be a failure and was finally discontinued during the year.

IV.—MEASURES OF PROTECTION.

10. *Communications.*—The East Coast Railway was placed under the control of the Director-General of Railways from 1st June 1893; 266 miles of this line were open for traffic at the end of the year. The Máyavaram-Muttupet Railway was completed during the year and was opened for traffic on 2nd April 1894. Fair progress was also made on the Nilgiri Railway. The Mysore Gold Fields Railway (10½ miles) connecting the Madras Railway with the Kolar gold fields was also completed during the year by the Mysore Durbar and opened for traffic on 1st June 1894.

Very fair progress was made in the detailed survey of the Madras-Bezwada line; of the total length of 291 miles, 261 miles have now been located, and complete project and estimates sent in for the portion from Madras to Ennore (10 miles), which it is proposed to construct at once. A preliminary reconnaissance of the country between Calicut and Tellicherry (43½ miles) has been made with a view to a proposed extension of the Madras Railway to Cannanore. The South Indian Railway Company has completed the survey of a line from Tinnevelly to Quilon (106 miles) and the French Government have asked permission to survey the Cuddalore-Pondicherry and Peralam-Karikal lines. The following proposed lines are now under the consideration of the Government of India:—

Mangalore to Arsikeri (137 miles).
Hassan to Mysore (66 miles).
Nanjangud to Erode (114 miles).
Shoranur to Cochin (61 miles).

11. *Advances to Agriculturists.*—The total advances disbursed during the year under the Land Improvement and the Agriculturists' Loans Acts amounted to Rs. 4,49,809 against Rs. 22,75,159 granted in 1892–93 and Rs. 16,85,665 granted in 1891–92. With the improvement in the season that has taken place since the close of the distress in 1891–92, the demand for State loans has greatly fallen off. Hence the large decrease in the amount disbursed, but there is no doubt that the very great labour which the working of the Loans Acts imposes on all grades of the District Revenue authorities, must in some measure be a bar to the extension of loan operations in ordinary years. In a time of emergency like the last period of distress, the amount of extra labour cheerfully borne by all grades in this good work was exceptionally great. More than 77 per cent. of the disbursements were made in Coimbatore, North Arcot, South Arcot, Tinnevelly and Kurnool.

The following table shows the amounts advanced under the two Acts during each of the past six years:—

Year.	Budget allotment under both Acts.	Advances made under		Total advances.
		The Land Improvement Loans Act.	The Agriculturists' Loans Act.	
	RS.	RS.	RS.	RS.
1888–89	2,00,000	1,30,822	36,517	1,67,339
1889–90	1,50,000	1,38,690	44,950	1,83,640
1890–91	2,41,900	2,27,942	43,562	2,71,504
1891–92	13,39,000	15,28,407	1,57,258	16,85,665
1892–93	23,00,000	20,41,809	* 2,33,350	22,75,159
1893–94	10,00,000	4,39,972	9,837	4,49,809

* The increase of Rs. 152 over that entered in the report for 1892–93 is due to the subsequent adjustments made by the Accountant-General.

12. *Irrigation.*—Good progress was made on the Rushikulya works in Ganjám and the Periyár project in Madura, the expenditure incurred upon them being Rs. 4 lakhs and 13·14 lakhs, respectively, which raises the total outlay up to the end of 1893–94 to Rs. 33·70 lakhs and 63·96 lakhs, respectively, against the sanctioned grants, 43·16 lakhs and 56·39 lakhs. The area likely to be protected by the Rushikulya works when completed is now estimated at 117,000 acres and that under the Periyár 192,400 acres.

Over 34 miles of the Rushikulya canal were opened for irrigation in the year under report in addition to the 19 miles opened in the previous year, but the area charged during the year was, however, only 6,762 acres. The area irrigated but not charged (with reference to Government Order, dated 30th June 1893, No. 2262, Revenue) was 1,169 acres. The Mahánadi canal was opened to its full length. On improvements to the Kistna delta, Rs. 3·81 lakhs were spent during the year, raising the total expenditure to 111·95 lakhs. The area irrigated by this work was 512,430 acres. Under the Gódávari delta, the area of first crop rose to 640,744 acres, while that under second crop amounted to nearly 81,000 acres. The ultimate extent of irrigation anticipated under this anicut was only 630,000 acres. The area irrigated by the Kurnool-Cuddapah canal during the year was acres 30,770 against 160,000 acres commanded by the work. A Special Deputy Collector has been appointed who will be able to devote his whole time and attention to an endeavour to develop the irrigation under the canal both in Kurnool and Cuddapah.

13. *Minor Irrigation.*—The minor irrigation works under the charge of the Revenue Department number over 28,000 having an irrigable area of about $1\frac{1}{2}$ million acres. The annual grant for their repairs is fixed at 4 lakhs, out of which barely $3\frac{1}{2}$ lakhs were expended during 1893–94.

V.—AGRICULTURAL EXPERIMENTS.

14. *General.*—Dr. Voelcker's Report on the improvement of Indian agriculture by scientific means was circulated during the year, and in doing so, the Government of India called a Conference together at Simla in October 1893 to discuss the various problems and proposals put forward therein. This Conference was attended on behalf of the Madras Government, by the Director of the Department and Mr. Nicholson, Collector of Anantapur. The results of the Conference are not yet known, for the Government of India has not, save on one or two minor points, issued any orders on its recommendations.

15. *Agricultural education.*—The status of the College of Agriculture remained unsettled during the year, but the final conclusions of the officers consulted regarding it were laid before Government, and orders have since been issued as to its reorganization. The course of instruction to be followed is that approved by Government in G.O., dated 22nd June 1894, No. 460, Educational, and appears to be free from all the objections raised by Dr. Voelcker to the older scheme in force at the time of his visit in 1890.

16. *School-farms.*—No progress towards starting these farms was possible during the year, owing to absence of permission from the Government of India to proceed with the scheme sanctioned in 1890 and revised in 1892. After the close of the year, the Government of India sanctioned the starting of the farms for experimental purposes only, but indicated that further orders must be awaited before any attempt at secondary agricultural education in connection therewith could be attempted. Nothing, however, is at present possible in any direction, owing to the absorption of the grant for the farms to meet the Imperial deficit.

17. *Agricultural inquiry.*—The Sub-Assistant Director was engaged in making detailed inquiries as to the growth of indigo and cotton in the Ceded Districts during part of the year, but it will require another season's work before the inspection can be regarded as complete.

18. The Secretary of State having called for information as to the yield of the principal crops in this country, the Government of India has directed the submission of quinquennial returns from all Provinces showing the average outturns of crops on average soils in a year of average character. With a view to get together the necessary data for such returns, orders have been issued to all Divisional officers and Tahsildars to make annually five crop-cutting experiments with the crops noted on the margin, where they are grown to any considerable extent, and detailed instructions for their guidance have been issued.

Paddy.	Gingelly.
Cholum.	Cotton.
Cumbu.	Sugarcane.
Ragi.	

The Deputy Director, at the instance of the Ganja Commission, made a special inquiry as to the methods of growth and manufacture of hemp (ganja) in the Presidency, the results of which were published in the form of a bulletin.

The Agricultural Chemist to the Government of India paid a brief visit to the Presidency in January 1894 when he visited Coimbatore, Bellary and Rajahmundry, to make himself acquainted with the sites proposed for the school-farms sanctioned by Government.

19. *Agricultural implements.*—The chief feature of the year is the recrudescence of the demand for heavy iron-ploughs in Bellary, where they are preferred for the purpose of breaking up and reclaiming black-cotton soil when overgrown by strong deep-rooted grasses. About 15 years ago, the Honorable Mr. A. Sabapathy Mudaliar, of Bellary, purchased from the department a dozen heavy iron-ploughs belonging to the department which had been sent out to this country after the Vienna Exhibition, where they attracted attention. These ploughs, which were of Swedish make, were remarkably cheap and well-made. He found them very useful and soon after imported and sold locally a large number. The demand later on fell off, but during the past season it sprang up again with great vigour and the supply of ploughs required fell far short of the demand. It appears probable that the demand will continue, and there is no doubt that these heavy iron-ploughs, for which the ryots have been paying Rs. 60 or more, have become established in the country around Bellary. There is, however, much room in Bellary and the adjoining districts of Anantapur, Cuddapah, Bellary and Kurnool for the use of a largely increased number of these implements. An Agricultural Inspector touring in the Bellary taluk reported in May last that he found 89 iron-ploughs in 9 villages; and an enterprising blacksmith at Bellary appears to have got out a large consignment of these ploughs from Sweden.

In order to extend the use of the bamboo seed-drill in the Northern Circars, two men were sent from Vizagapatam during the year to the Kistna district to be trained in its use. They returned too late to do anything in the last season, but will be employed to show the working of the drills during the current year.

20. *Experimental crops.*—The late sown barley crop was again a failure on the Nilgiris owing partly to unseasonable rain and partly to heavy frost at the time of harvest, and there was no competition for the prizes. It has since been decided, on the recommendation of the Collector, to revert to the old system of offering prizes for the best samples of barley of the first or early season.

The further experiments in the introduction of wheat from the Central Provinces alluded to in paragraph 19 of the last report failed owing to the receipt of the wheat seed very late in the season and in a damaged condition. The experiment will be again repeated during the current year.

Further experiments in the introduction of new varieties of potatoes in the Nilgiris are in progress under the management of the Government Botanist.

21. *Bulletins.*—The following bulletins were published during the year under report:—

No. 28.—The ground, earth, or pea-nut (*Arachis Hypogeia*).

No. 29.—The cultivation and manufacture of ganja in Madras.

No. 30.—The extraction of *Agave Americana* fibre in Coimbatore.

22. *Phosphatic deposits.*—Dr. Warth conducted a further detailed examination of the area containing phosphatic nodules in the Trichinopoly district, the result of which was to confirm his original estimate of the amount—4,000 tons—of nodules to be found on the surface. He has also by means of a series of trial-pits sunk across the field arrived at the conclusion that below the surface the nodules are to be found diffused to the amount of 28 lb. per 100 cubit feet. The area of the field in which the nodule bearing beds are exposed is about 10 square miles, and at the above rate the quantity obtainable within 200 feet of the surface would be about 7 million tons. Dr. Warth estimates the cost at which the nodules could be raised and delivered at Trichinopoly at Rs. 20 a ton.

23. *Corundum occurrences in Salem.*—Mr. Middlemiss of the Indian Geological Survey arrived in the Presidency in November last and was engaged during the working season in an examination of the corundum occurring in parts of Salem. It is proposed by the Geological Survey Department to issue hand books showing the mineral resources of all important districts, and Salem has been taken up first as its petrology is of great interest, and attention has recently been drawn, not only to its iron and corundum deposits, but also to the possible utilization of other mineral occurrences in rocks associated with these ores.

24. *Insect pests.*—In a few villages of Kurnool and Bellary, locusts or grasshoppers appeared in July and August 1893, but did only slight damage and soon disappeared. Specimens of insects which were reported to be doing damage to the paddy crop in South Arcot were received in January last and were forwarded to the Superintendent, Central Museum. No report thereon has as yet been received.

A proposal of the Government of India that pictorial lesson sheets of common insects should be prepared and issued in the vernacular for use in schools was under discussion during the year, and it was concluded that the idea was an excellent one, but that the usefulness of the sheets would depend on their applicability to local conditions. It was therefore considered necessary that the insect pests of the Presidency should first be studied by a competent entomologist. The Government of India is endeavouring to make arrangements for obtaining the services of such an officer.

25. *Societies.*—The Director continued to be a member of the Committee of the Madras Agri-Horticultural Society, the operations of which were continued on the same lines as heretofore. The income of the Society amounted to Rs. 11,162, of which Rs. 4,000 was derived from the Government grant and Rs. 2,131 from subscriptions. The number of members fell off by 5, although 15 new members were elected against 13 in the previous year. The annual flower show was held in February and was well attended. The exhibits, both floral and vegetable, were generally good and compared favorably with those of former years, the good monsoon of the year contributing greatly to this result. Some alterations and improvements were made in the gardens and a large number of plants of economic interest were distributed to planters and others.

VI.—CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

26. *Mortality among live-stock.*—The subjoined table compares the mortality amongst live-stock reported during the year with that reported in the preceding year and with the average for the five years ending 1892–93.

Causes of death.	Number amongst cattle.			Number amongst sheep and goats.			Number amongst horses and ponies.		
	Average up to 1892–93.	In 1892–93.	In 1893–94.	Average up to 1892–93.	In 1892–93.	In 1893–94.	Average up to 1892–93.	In 1892–93.	In 1893–94.
Diseases.									
Rinderpest	35,896	13,104	13,155	2,935	2,099	2,700	..	..	..
Diarrhœa and Dysentery ..	31,485	32,812	18,104	4,527	5,777	2,901	11	22	17
Total ..	67,381	45,916	31,259	7,462	7,876	5,601	11	22	17
Anthrax	18,725	15,855	22,405	4,880	5,893	4,403	13	15	37
Foot and mouth diseases ..	6,390	6,659	8,239	1,636	571	3,289	..	..	1
Variola	2,640	2,348	1,523	6,333	2,258	7,295	3	..	..
All others	28,097	31,212	28,089	12,178	15,553	11,487	123	105	175
Total from disease ..	123,233	101,990	91,515	32,489	32,151	32,075	150	142	230
Other causes.									
Natural decay	..	..	124,096	..	..	25,384	..	..	308
Accident	..	..	6,037	..	..	4,904	..	..	33
Snake-bite	2,342	1,780	2,445	220	184	155	7	6	4
Wild animals	9,982	9,152	11,497	7,059	5,019	5,766	135	160	211
Criminal poisoning	32	20	21	5	..	..	..	..	..
Total from other causes ..	12,356	10,952	144,096	7,284	5,203	36,209	142	166	556
Grand Total ..	135,589	112,942	235,611	39,773	37,354	68,284	292	308	786

27. *Loss of cattle from diseases.*—The total loss of cattle from various diseases during 1893–94 was less than that of the previous year by 10,475 or 10·3 per cent., and less than the average of the past five years by 31,718 or 25·7 per cent. The decreases occurred under all heads except rinderpest, anthrax and epizootic aphtha. Nearly a fourth of the deaths from anthrax occurred in Gódávari, where the disease broke out in a serious form in the previous year. Ganjám, Kistna, Cuddapah, Chingleput, South Arcot, North Arcot, Tanjore and Madura also suffered seriously as in the preceding year.

These nine districts account for 80·9 per cent. of the deaths from this disease. The first four districts and Kurnool and South Canara account for 62·5 per cent. of the deaths under rinderpest, diarrhœa and dysentery. Under epizootic aphtha, more than half the number of deaths reported was, as in the previous year, from the Ganjám district alone. Under "all other diseases," Gódávari, Kistna, Kurnool, Coimbatore and Madura show the largest number of deaths, amounting to 50·9 per cent. of the mortality under this head. Taking all diseases together, the mortality per mille ranged highest in the three northern districts and Kurnool, between 11 and 15 per mille. In Kistna, Cuddapah, Chingleput and Madura, it amounted to 7 per mille each. The average for the Presidency was only 5·3 per mille or less than that of each of the past five years as shown below :—

Year.	Horned cattle.			Sheep and goats.			Horses and ponies.		
	Number of		Death-rate per mille.	Number of		Death-rate per mille.	Number of		Death-rate per mille.
	Stock *	Deaths.		Stock.*	Deaths.		Stock.*	Deaths.	
1888-89	13,699	196,264	14·3	11,390	29,279	2·6	39	99	2·5
1889-90	14,476	128,466	8·9	12,061	39,599	3·3	43	153	3·6
1890-91	14,959	102,097	6·8	12,467	29,977	2·4	43	199	4·6
1891-92	14,849	87,349	5·9	12,715	31,438	2·5	42	155	3·7
1892-93	14,342	101,990	7·1	13,197	32,151	2·4	40	142	3·5
Average	14,465	123,233	8·5	12,366	32,489	2·6	41	150	3·7
1893-94	16,192	86,554 †	5·3	14,218	30,550 †	2·1	40·7	226 †	5·6

* Thousands. † Excluding zemindaris for which information as to total stock is not available.

28. *Loss of cattle from other causes.*—The registration of deaths from natural decay and accidents was resumed from April 1893, and the mortality returned under the first head during the year was 124,096 head of cattle as against 91,515 reported to have died from disease. The deaths numbered between ten to over thirteen thousand in each of the six districts noted on the margin, amounting to a total of 75,136 or 60·5 per cent. of the deaths under this head. In South Arcot and Tinnevelly also, the deaths were numerous, over 8,000 head each.

Gódávari, Chingleput, North Arcot, Tanjore, Malabar and South Canara.

29. *Loss from ravages of wild animals and from snake-bite, &c.*—There was a large increase in the number of cattle killed by wild animals and snake-bites, &c., which is, however, spread over most of the districts of the Presidency. The loss from wild animals was, as usual, large in the two West Coast districts, Coimbatore and North Arcot and was considerable also in Cuddapah, Kurnool and Gódávari. Deaths from snake-bites were most numerous in Chingleput.

The number of deaths from criminal poisoning was 21 or 1 more than in the previous year, and 11 less than the average. The subjoined statement shows what action was taken in each case that was reported :—

District.	Number of cattle poisoned.	Action taken.
Gódávari	1	In this case, there was no evidence that the animal died of poison.
Kistna	1	In one of the cases, the accused was discharged for want of evidence.
Kurnool	3	In one of the cases, the accused was discharged as the viscera contained no poison ; in another, the accused was sentenced to 4 months' rigorous imprisonment ; the offenders could not be traced in the third.
Anantapur	1	The accused was sentenced to 4 months' rigorous imprisonment and to pay a fine of Rs. 20 and in default of fine to undergo a further imprisonment of one month.
Cuddapah	1	The accused was sentenced to 6 months' rigorous imprisonment.
Coimbatore	7	In one of the cases, the accused was sentenced to 4 months' rigorous imprisonment and discharged in two others for want of evidence; in the remaining four cases, the offenders could not be traced.
Trichinopoly	1	The accused was sentenced to 4 months' rigorous imprisonment.
Tanjore	1	In this case, the offenders could not be detected.
Madura	5	In four cases, no proof could be obtained as to who the culprits were, and in the fifth, the offender was convicted and sentenced.

30. *Total loss of cattle.*—Taking the total loss of cattle from all causes, it will be seen that the death-rate for the Presidency averaged 13·9 per mille and that this limit was exceeded in the four northern districts (Circars), in Kurnool, Chingleput, Tanjore, Madura, Tinnevelly, Nilgiris and the two West Coast districts. In the Nilgiris, the rate per mille was 42 and in South Canara 30, Chingleput following with 27. In some districts in which the mortality from disease was comparatively small, the deaths from natural decay were heavy. The monthly statement of cattle mortality printed in the Appendix shows that the deaths from all causes increased steadily from 10,520 in April to 32,866 in November 1893. After that date, they slightly declined though they were still higher than the deaths reported in the first three months. The mortality in the second half of the year during which cattle suffer most from rain and cold was much higher than in the first half, 140,220 against 95,391, October, November and December being the worst months.

31. The mortality amongst sheep and goats and horses and ponies does not call for remark. Of the total of 68,284 sheep and goats reported to have died, 32,075 were carried off by disease, 25,384 are shown to have died from natural decay and the rest from other causes, such as accidents, ravages by wild animals, &c. Madura and Tinnevelly show the largest deaths under this class, about 15,000 head. Anantapur, Cuddapah, Trichinopoly and Coimbatore also exhibit heavy losses, aggregating nearly 21,300 head. The death-rate was under 5 per mille in all the districts except the three northern districts, Chingleput, Madura, Tinnevelly and Malabar. In the three northern districts where the rate works out to 21, 11 and 16 per mille, it is probable that the stock has not been correctly returned. In Chingleput and Malabar, the rate was 6 per mille, and in Madura and Tinnevelly, 10 and 7 respectively.

32. *Civil Veterinary Department.*—Veterinary-Captain Burke continued to be Superintendent, Civil Veterinary Department, until November 1893, when he proceeded on sick leave to Europe. He was employed chiefly in teaching Veterinary Science at the College of Agriculture at Saidapet. He also went on a short tour in the Coimbatore district during the college vacation and was present at the Tirupur show in June and at the Hosur show in July 1894. Veterinary-Lieutenant Turnbull was appointed Superintendent in place of Veterinary-Captain Burke and took charge of his post on 19th January 1894, but as it was so near the end of the college session when he arrived, Mr. Turnbull did not take up any lecturing work at Saidapet during the year. He was present at the pony show at Hosur in March last.

Deputy Superintendent M.R.Ry. Narayana Row was on duty throughout the year and was engaged in supervising the pony-breeding operations in the Salem and Coimbatore districts. His death since the close of the year under report is greatly to be regretted.

One of the Stock Inspectors attached to this branch of the department died, and thirteen remained on the list. They were chiefly employed on miscellaneous work in the Board's office and occasionally on the inspection of wells under construction from State loans, as, pending the issue of the orders of the Government of India on the work and organization of the Civil Veterinary Department, it was not possible to undertake any specific work with reference to cattle disease during the year. The Board has since arranged to put the Stock Inspectors through a special course of training under the Superintendent with a view to fit them for carrying on the Bacteriological Survey ordered in G.O., dated 24th August 1893, No. 756.

33. The Government decided during the year to organize a class for secondary veterinary instruction in connection with the College of Agriculture. Proposals to this end were laid before Government towards the end of the year, but the final decision on the matter has been held over pending receipt of a further communication promised from the Government of India.

34. At the instance of the Government of India, it is proposed to compile a manual of information regarding the breeds and management of the cattle of the Presidency. A portion of the work was entrusted to the late Deputy Superintendent, Civil Veterinary Department, but he died before, it is believed, he had completed his inquiry.

35. *Pony-breeding.*—These operations were as usual confined to the Coimbatore and Salem districts. Three stallions worked in the former district throughout the year and two more for periods of eight and six months respectively. In Salem, four stallions were working at the beginning of the year, of which two were disposed of during the year as unfit for breeding purposes and a new stallion was sent to the district in July. The work done by the stallions was satisfactory in both the districts. The results of the coverings effected in 1892–93 in Coimbatore were favorable; but the percentage of successful coverings was low in Salem though better than in the two preceding years. In all, 415 mares were covered during the year—206 in Coimbatore and 209 in Salem.

Since the close of the year, four more stallions were purchased through Veterinary-Captain Mills of Bombay. Three of these have been sent to Coimbatore and one to Salem. The Board regrets to find that in the Superintendent's opinion, these stallions do not show enough quality or breeding to stamp their race upon the country mares. The Superintendent also considers it unfortunate that at least two of the pony stallions were not bigger.

VII.—MISCELLANEOUS.

36. No change was made during the year in the number or dates of issue of crop forecasts which were all duly published on the dates shown in the subjoined statement:—

Crops.	Report.		
	Sowings.	Forecast (first).	Forecast (second).
Paddy	15th October	15th December ..	15th February.
Indigo	15th September	15th „ ..	....
Gingelly, early	15th August	1st November ..	....
Do. late	1st January	15th April	....
Cotton	15th August (first) .. 10th October (second) ..	10th December	10th February.

37. The total amount of the *rail-borne trade* of the Presidency during 1893–94 was about 5 per cent. more than in the previous year, but slightly less than in 1891–92; the value of the articles carried was greater than in either of the two previous years by 5 and 10 per cent. respectively. The subjoined statement gives the details of the last five years:—

Year.	Imports.		Exports.		Internal.		Total.	
	Amount.*	Value.†	Amount.*	Value.†	Amount.*	Value.†	Amount.*	Value.†
1889-90	3,783	3,93	4,311	3,72	23,752	19,15	31,846	26,80
1890-91	5,353	4,43	4,306	3,70	26,983	20,26	36,642	28,39
1891-92	7,027	5,25	4,717	3,61	27,305	19,79	39,049	28,65
1892-93	7,257	5,53	5,399	4,16	24,110*	20,44	36,766	30,13
1893-94	7,661	5,64	6,125	4,46	25,021	21,45	38,807	31,55

* Thousands of maunds. † Lakhs of rupees.

38. The increase in the volume and value of the trade as compared with previous year occurred under all the heads, viz., import, export and local, the largest percentage increase occurring in the export trade.

The imports from other provinces amounted to 7·66 millions of maunds, of which nearly one-half was grain and one-fifth coal and coke; compared with the previous year there was an increase of 4,04,000 maunds or 5½ per cent. in volume and of 11 lakhs or 2 per cent. in value. The increase is wholly due to increased imports of coal and coke from the Nizam's territory, nearly 1,554,000 maunds having been imported

in the year against 1,050,000 maunds in the previous year. There was an increase of 804,000 maunds in the imports of grain from Mysore which was, however, more than counterbalanced by a falling off of over 717,000 maunds in the imports from the Nizam's territory, and of 112,000 maunds in those from Bombay.

The exports to other provinces increased by 726,000 maunds or nearly 13½ per cent. in volume and by 7¼ per cent. in value. The increase occurs mainly under exports of coal and coke to Mysore and of raw cotton and oil-seeds to Bombay.

The internal trade of the Presidency increased by nearly 911,000 maunds or 4 per cent. in volume and by 101 lakhs or 5 per cent. in value, the increase occurring chiefly under grain and pulse and under stone and lime.

39. The distribution of the total trade of the Presidency among the different blocks into which it is divided for purposes of registration is shown below :—

Imports.

Internal blocks of the Presidency.	1892–93. Foreign.	1892–93. Internal.	1892–93. Total. Quantity.	1892–93. Total. Percentage.	1893–94. Foreign.	1893–94. Internal.	1893–94. Total. Quantity.	1893–94. Total. Percentage.	Percentage, increase or decrease.
1	2	3	4	5	6	7	8	9	10
	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Madras port	1,210,085	4,933,465	6,143,550	19·6	1,214,447	5,625,715	6,840,162	20·9	+ 11·3
2. Pondicherry port	7,685	1,356,909	1,364,594	4·3	10,567	1,098,538	1,109,105	3·4	— 18·8
3. Negapatam port	11,580	1,119,973	1,131,553	3·7	16,630	876,806	893,436	2·7	— 21·2
4. Tuticorin port	20,539	1,062,599	1,083,138	3·5	32,332	1,004,562	1,036,894	3·2	— 4·3
5. Calicut port	16,214	544,265	560,479	1·8	23,571	630,667	654,238	2·0	+ 12·5
6. Ceded districts and Kurnool	1,476,182	1,357,747	2,833,929	9·0	1,024,814	1,293,577	2,318,391	7·2	— 18·2
7. Nelloro	3,852	283,682	287,534	1·0	5,353	293,129	298,482	0·9	+ 3·8
8. Chingleput and North Arcot	652,706	2,373,082	3,025,788	9·7	633,532	2,743,085	3,376,617	10·3	+ 11·6
9. South Arcot, Tanjore and Trichinopoly	151,574	3,898,755	4,050,329	12·6	251,825	3,720,588	3,972,413	12·1	— 1·9
10. Madura and Tinnevelly	419,375	4,524,989	4,944,364	15·8	419,204	4,779,638	5,198,842	15·9	+ 5·2
11. Salem, Coimbatore and Malabar	1,698,571	2,518,743	4,217,314	13·5	2,164,984	2,595,904	4,760,888	14·6	+ 12·9
12. Kistna and Gódávari	1,588,860	135,580	1,724,440	5·5	1,816,300	304,085	2,120,385	6·5	+ 23·0
13. Northern Circars	..	..	..	..	47,387	54,528	101,915	0·3	..
Total	7,257,223	24,109,789	31,367,012	100·0	7,660,946	25,020,822	32,687,768	100·0	+ 4·2

Exports.

Internal blocks of the Presidency.	1892–93. Foreign.	1892–93. Internal.	1892–93. Total. Quantity.	1892–93. Total. Percentage.	1893–94. Foreign.	1893–94. Internal.	1893–94. Total. Quantity.	1893–94. Total. Percentage.	Percentage, increase or decrease.
1	2	3	4	5	6	7	8	9	10
	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Madras port	2,669,913	3,593,719	6,263,632	21·2	2,758,580	3,400,060	6,158,640	19·8	— 1·7
2. Pondicherry port	2,531	115,389	117,920	0·4	6,090	101,846	107,936	0·3	— 8·5
3. Negapatam port	1,450	1,639,309	1,640,759	5·6	4,611	1,428,344	1,432,955	4·6	— 12·7
4. Tuticorin port	848	1,782,239	1,783,087	6·0	3,519	2,590,479	2,593,998	8·3	+ 45·5
5 Calicut port	88,610	948,250	1,036,860	3·5	61,028	794,473	855,501	2·7	— 17·5
6. Ceded districts and Kurnool	521,955	1,601,698	2,123,653	7·2	1,135,357	2,719,744	3,855,101	12·4	+ 81·5
7. Nellore	739	374,185	374,924	1·3	1,140	706,136	707,276	2·3	+ 88·7
8. Chingleput and North Arcot	696,189	4,552,493	5,248,682	17·8	686,311	4,766,016	5,452,327	17·5	+ 3·9
9. South Arcot, Tanjore and Trichinopoly	161,868	5,051,036	5,212,904	17·6	149,614	4,066,551	4,216,165	13·5	— 19·1
10. Madura and Tinnevelly	7,840	1,699,357	1,707,197	5·8	10,330	1,564,914	1,575,244	5·1	— 7·7
11. Salem, Coimbatore and Malabar	757,041	2,357,167	3,114,208	10·6	903,223	2,398,212	3,301,435	10·6	+ 6·0
12. Kistna and Gódávari	490,292	394,947	885,239	3·0	398,583	469,692	868,275	2·8	— 1·9
13. Northern Circars	..	..	..	..	6,528	14,355	20,883	0·1	..
Total	5,399,276	24,109,789	29,509,065	100·0	6,124,914	25,020,822	31,145,736	100·0	+ 5·5

40. *Road Traffic.*—The scheme for the registration of interprovincial and of internal traffic at selected stations sanctioned in G.O., dated 1st November 1888, No. 754, contemplated the registration being carried out in particular tracts each year, the work being completed in the course of five years. The registration of the traffic at all the stations sanctioned in 1888 was completed by the close of 1892–93 and the results have already been published. In 1890, the Government of India issued a circular regarding the registration of road and river traffic, which required that traffic on each road or river should be registered for a number of years representative of the average capacities of the track concerned and not for a season or two which may happen to be exceptional. A period of three years was considered a sufficiently long one for the purpose indicated; but as the scheme sanctioned in 1888 had not then been fully carried out, it was considered advisable to continue the existing arrangements till the end of 1892–93, when a fairly complete registration of traffic both internal and interprovincial would have been secured and it would be possible to decide which of the roads dealt with were really important and to arrange for the registration of traffic on them for a further period, as suggested by the Government of India, by a trained permanent establishment. The subjoined table shows the roads and stations selected for the registering of traffic during the year under review :—

District.	Description of the roads.	Registering stations.
Tinnevelly	Tinnevelly-Trevandrum	(1) Tenkási. (2) Panakudi.
Madura	Madura-Ramnad	(3) Manamadura.
	Dindigul-Pollachi	(4) Palni.
Coimbatore	Karúr and Trichinopoly-Pollachi	(5) Dhárápuram.
	Coimbatore-Malabar	(6) Pollachi.
Malabar	Malabar-Cochin	(7) Mangalam. (8) Chetwai. (9) Shoranur.
	Calicut-Wynaad	(10) Malaparamba.
	Calicut-South Canara	(11) Payyoli lock. (12) Quilandi.
	Cannanore-Coorg	(13) Muttanur.
South Canara	Mangalore-Coorg-Mysore	(14) Uppinangady. (15) Beltangudi. (16) Puttúr.
Salem	Trichinopoly-Salem	(17) Námakkal.
	Salem-South Arcot	(18) Atur.
Trichinopoly	Trichinopoly and Salem	(19) Near Perambalúr.
Nellore	Madras-Guntúr	(20) Náyudupéta. (21) Kávali. (22) Ongole.
Vizagapatam	Vizagapatam-Jeypore	(23) Pottangi.
	Vizagapatam-Central Provinces	(24) Rayagada. (25) Ennapur.
Ganjám	Gánjam-Central Provinces	(26) Kalingya.

APPENDIX I.

Letter from Veterinary-Lieutenant H. P. TURNBULL, Superintendent, Civil Veterinary Department, Madras Presidency, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated Madras, 1st June 1894, No. 239.

I have the honour to submit a report on the work done during the second year's operations of the Civil Veterinary Department, viz., 1893–94. I took charge of the post of Superintendent, Civil Veterinary Department, on the 19th January 1894.

A. Pony-breeding.—This branch was in immediate charge of Mr. Narain Rao, G.B.V.C., Deputy Superintendent, Civil Veterinary Department, subject to the general control of this office. This officer contracted fever while on tour in the Coimbatore district and died in May last, and in him, the Government have lost a very promising young and hardworking officer.

There were at the commencement of the year, in all, seven stallions, of which four were in Salem and three in Coimbatore. Three more were purchased, and two were sold as unfit for further service, increasing the number to eight stallions at the end of the year, of which three have been in Salem and five in Coimbatore. Four more were purchased in May last, of which three are located in Coimbatore and one was told off to the Salem district.

Marginally are noted the number of mares covered by each of the stallions during the year, from which it will be observed that stallion "Rajah" covered only 15 mares in course of seven months and "Nawab" only 13 mares in five months. The causes of their short work will be explained in the report on pony-breeding.

	Number of mares covered during the year.	
Salem district.		
Padshaw	32 (sold).	
Abdoolla	50	
Carbon	67	
Ranger	60	
	—	209
Coimbatore district.		
Parfactamour	51	
Agha	60	
Sultan	67	
Rajah	15	
Nawab	13	
	—	206
Total ..		415

B. Cattle disease investigation and prevention.—(1) It is intended to give a course of two months' special training to the Stock Inspectors to enable them to conduct the duties in regard to Bacteriological investigations on the lines indicated by Veterinary-Lieutenant Pease. The practical portion is now delayed owing to the fact that no cattle disease is yet reported to this office from certain districts to which it is my intention to confine the work of investigation at present.

(2) Cattle disease having broken out in the taluk of Nandikotkur in the Kurnool district a Stock Inspector of this department was deputed to make an investigation as to the outbreak which appeared to be one of rinderpest. The detailed report submitted by the Inspector thereon was duly submitted to the Assistant to the Inspector-General, Civil Veterinary Department.

Another outbreak of cattle disease was reported from Ganjám district, and the Stock Inspector who was then employed in that district was ordered by this office to investigate it, but the Inspector having returned to Madras before the order reached him, no further action was taken.

(3) No action was taken as regards treatment of or dealing with cattle disease, as the Government have given up at present all efforts in that direction.

C. Cattle-breeding.—No cattle-breeding is carried on in this Presidency by the Government. Several cattle fairs are annually held in many parts of the Presidency, of which those visited by the Stock Inspectors during the year were the Chitra fair in Madura and Subramonea in South Canara. Cattle Disease Act II of 1866 was enforced in both places on the occasion. No prosecutions were conducted at the Chitra cattle fair, as there were no contagious diseases prevalent among the cattle. At the Subramonea fair, however, a cattle dealer was prosecuted under section 4 of the Act, which resulted in the fining of the accused. There are no cattle shows held in the Presidency.

D. Veterinary Instruction.—The veterinary class ordered by the Government to be opened at Saidapet is not yet commenced. Orders are awaited on the point.

The strength of the department during the official year was as follows:—

Superintendent	1	
Deputy Superintendent	1	
Stock Inspectors	13	(*Vide* appendix No. 1).
Clerk	1	
Peons	3	
Total ...	19	

The Deputy Superintendent, the late Mr. M. Narain Rao, was temporarily employed in connection with pony-breeding operations. The Stock Inspectors continued to be working in the Board's office on clerical duty, though a few of them were occasionally employed on some veterinary work for short periods.

E. General.—(1) The districts visited by my predecessor and myself during the year were Salem and Coimbatore. This was chiefly in connection with pony-breeding operations and pony shows.

(2) During the year three pony shows were held—one in Tirupúr, Coimbatore district, in June 1893, and two of Hosúr, Salem district, one in July 1893 and another in March 1894. The first two were visited by my predecessor Veterinary-Captain Burke, and the last by me. Reports of judges of the committee on each of the shows have been duly submitted to the Board.

(3) Miles travelled by Veterinary-Captain Burke—

By road	152
By rail	1,116
By boat or steamer	*Nil.*
Miles travelled by me—	
By road	46
By rail	385
By boat or steamer	*Nil.*

Imperial charges during the year was Rs. 9,246 (*vide* appendix No. 2).

The office work of the department was carried on during the past year by Clerk Abboy Naidu both punctually and efficiently; but as extra work, such as all the correspondence with reference to pony-breeding operations and reviewing cattle mortality statisitics have been thrown upon this office, and as he is also required to accompany the Superintendent on district inspection more frequently than formerly, which naturally delays the regular office work, it is suggested that either another Clerk may be detailed to assist him or that temporarily a Stock Inspector may be instructed to work in the office.

The service books of the establishment have been brought up to date and verified.

APPENDIX II.

MONTHLY Statistics of mortality among cattle in the Madras Presidency during the year 1893–94.

Months.	Number of deaths due to disease.							Deaths due to other causes.						Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1893	1,253	1,065	1,165	418	50	1,571	5,522	4,029	221	104	644	..	4,998	10,520
May ,, ...	1,176	1,008	1,574	329	48	1,672	5,807	5,509	281	127	805	5	6,727	12,534
June ,, ...	1,174	762	1,830	314	65	1,801	5,946	7,393	412	163	883	1	8,852	14,798
July ,, ...	979	1,088	2,600	450	193	1,827	7,137	9,021	455	195	1,137	2	10,810	17,947
August ,, ...	1,080	1,722	2,582	759	151	2,328	8,622	8,866	400	221	1,038	1	10,526	19,148
September ,, ...	872	1,800	2,113	946	165	2,722	8,618	9,852	458	287	1,219	10	11,826	20,444
October ,, ...	1,149	2,136	2,338	899	270	2,861	9,653	10,301	491	293	1,200	1	12,286	21,939
November ,, ...	1,216	2,447	2,620	1,327	165	4,120	11,895	17,610	1,768	336	1,256	1	20,971	32,866
December ,, ...	1,099	1,632	1,609	953	97	3,044	8,434	14,858	505	213	982		16,558	24,992
January 1894	1,022	1,956	1,886	1,009	46	2,386	8,305	15,435	374	208	1,050	..	17,067	25,372
February ,, ...	1,154	1,516	1,080	394	169	2,076	6,389	11,437	341	158	636	..	12,572	18,961
March ,, ...	981	972	1,008	441	104	1,681	5,187	9,785	331	140	647	..	10,903	16,090
* Total ..	13,155	18,104	22,405	8,239	1,523	28,089	91,515	124,096	6,037	2,445	11,497	21	144,096	235,611

* Includes zemindaris.

Monthly statistics of mortality among sheep and goats in the Madras Presidency during the year 1893–94.

Months.	Number of deaths due to diseases.							Deaths due to other causes.						Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1893	133	34	81	34	657	405	1,344	907	52	8	348	..	1,315	2,659
May ,, ...	120	47	210	95	368	632	1,472	1,349	144	9	300	..	1,802	3,274
June ,, ...	90	57	124	129	230	540	1,170	698	21	11	414	..	1,144	2,314
July ,, ...	219	66	384	127	315	517	1,628	1,676	73	15	567	..	2,331	3,959
August ,, ...	330	76	312	136	64	534	1,452	1,126	37	15	458	..	1,636	3,088
September ,, ...	238	341	606	281	162	577	2,205	1,263	42	19	500	..	1,824	4,029
October ,, ...	240	348	306	805	130	777	2,606	1,706	735	26	639	..	3,106	5,712
November ,, ...	263	227	737	601	391	2,740	4,959	6,037	3,365	14	949	..	10,365	15,324
December ,, ...	271	601	581	519	515	1,501	3,988	4,077	132	3	499	..	4,711	8,699
January 1894	405	287	464	194	697	1,419	3,466	2,418	178	14	416	..	3,026	6,492
February ,, ...	209	475	326	297	1,801	667	3,775	2,124	80	14	332	..	2,550	6,325
March ,, ...	182	342	272	71	1,965	1,178	4,010	2,003	45	7	344	..	2,399	6,409
* Total ..	2,700	2,901	4,403	3,289	7,295	11,487	32,075	25,384	4,904	155	5,766	..	36,209	68,284

* Includes Zemindaris.

Monthly statistics of mortality among horses and ponies in the Madras Presidency during the year 1893–94.

Months.	Number of deaths due to diseases.							Deaths due to other causes.						Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1893	..	1	2	..	..	7	10	6	..	..	22	..	28	38
May ,, ...	..	..	1	..	..	10	11	14	2	..	20	..	36	47
June ,, ...	..	..	2	..	..	1	3	14	2	..	10	..	26	29
July ,, ...	..	..	1	..	..	19	20	21	4	..	33	..	58	78
August ,, ...	..	1	..	..	..	18	19	26	3	2	11	..	42	61
September ,, ...	..	1	4	..	..	29	34	39	2	..	18	..	59	93
October ,, ...	..	3	7	..	..	11	21	27	4	..	10	..	41	62
November ,, ...	..	4	4	1	..	18	27	43	8	..	15	..	66	93
December ,, ...	..	3	1	..	..	8	12	43	3	..	14	..	60	72
January 1894	..	1	7	..	..	19	27	38	1	1	16	..	56	83
February ,, ...	..	3	..	..	..	12	15	22	4	1	18	..	45	60
March ,, ...	..	..	8	..	..	23	31	15	..	..	24	..	39	70
† Total ..	..	17	37	1	..	175	230	308	33	4	211	..	556	786

† Includes Zemindaris.

Statistics of mortality among cattle in the Presidency of Madras during the year 1893–94.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.						Total.		Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and Dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	7,046	1,510	1,580	1,112	4,540	52	1,000	9,794	14	2,053	9	64	305	..	2,431	12,225	17
Vizagapatam ..	1,636	326	265	332	351	133	1,058	2,465	15	1,188	80	30	118	..	1,416	3,881	24
Gódavári	11,688	444	3,747	5,183	658	32	3,210	13,274	11	10,052	268	186	784	1	11,291	24,565	21
Kistna	10,511	407	2,647	1,165	113	329	2,535	7,196	7	6,547	465	165	156	1	7,334	14,530	14
Kurnool	5,887	2,240	255	942	69	10	3,088	6,604	11	2,801	178	79	507	3	3,568	10,172	17
Bellary	5,241	179	62	136	66	20	996	1,459	3	800	86	13	170	..	1,069	2,528	5
Anantapur	6,452	245	306	252	81	9	1,694	2,587	4	1,765	143	41	137	1	2,087	4,674	7
Cuddapah	8,988	2,391	860	1,490	141	71	1,663	6,616	7	3,224	325	76	655	1	4,281	10,897	12
Nellore	4,648	330	384	792	39	4	720	2,269	5	1,157	197	56	88	..	1,498	3,767	8
Chingleput ..	6,122	477	1,001	1,234	139	36	1,655	4,542	7	11,240	313	473	45	..	12,071	16,613	27
South Arcot ..	11,386	686	194	2,156	84	1	949	4,070	4	8,766	351	138	88	..	9,343	13,413	12
North Arcot ..	16,899	363	1,291	2,337	161	..	63	4,215	3	10,813	310	253	1,034	..	12,410	16,625	10
Salem	8,759	75	107	102	27	6	522	839	1	316	44	39	291	..	690	1,529	2
Coimbatore ..	11,050	110	463	419	226	101	3,105	4,424	4	1,743	110	119	1,040	7	3,019	7,443	7
Trichinopoly ..	6,314	262	361	337	78	38	838	1,914	3	3,553	639	70	17	1	4,280	6,194	10
Tanjore	9,669	184	155	1,832	141	10	635	2,957	3	12,246	401	97	3	1	12,748	15,705	16
Madura	6,196	127	483	900	103	130	2,373	4,116	7	4,420	252	225	329	5	5,231	9,347	15
Tinnevelly ..	6,451	44	607	228	25	36	328	1,268	2	8,103	170	111	109	..	8,493	9,761	15
Nilgiris	681	59	8	..	15	1	82	165	2	2,087	164	15	459	..	2,725	2,890	42
Malabar	9,215	285	368	38	187	27	396	1,301	1	13,326	184	73	2,113	..	15,696	16,997	18
South Canara ..	7,080	1,772	1,673	154	183	304	393	4,479	6	13,215	1,153	17	2,687	..	17,072	21,551	30
Total ..	161,919	12,516	16,817	21,141	7,427	1,350	27,303	86,554	5·3	119,415	5,842	2,340	11,135	21	138,753	225,307	13·9
In Zemindaris.																	
Vizagapatam ..	Not available.	403	882	530	781	173	714	3,483	..	431	61	21	58	..	571	4,054	..
Nellore		..	4	2	..	..	61	67	..	6	14	4	5	..	29	96	..
North Arcot ..		236	401	732	31	..	11	1,411	..	4,244	120	80	299	..	4,743	6,154	..
Total ..	..	639	1,287	1,264	812	173	786	4,961	..	4,681	195	105	362	..	5,343	10,304	..
Grand Total ..	161,919	13,155	18,104	22,405	8,239	1,523	28,089	91,515	..	124,096	6,037	2,445	11,497	21	144,096	235,611	..

Statistics of mortality among sheep and goats in the Presidency of Madras during the year 1893–94.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.						Total.		Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and Dysentery	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	1,622	713	268	170	1,438	46	271	2,906	18	394	2	1	93	..	490	3,396	21
Vizagapatam ..	627	6	2	19	270	12	133	442	7	132	22	..	68	..	222	664	11
Gódávari	2,083	7	172	382	170	192	1,502	2,425	12	637	11	2	162	..	812	3,237	16
Kistna	5,213	..	54	139	206	747	135	1,281	2	497	139	5	264	..	905	2,186	4
Kurnool	5,381	..	3	31	4	919	246	1,203	2	151	108	16	439	..	714	1,917	4
Bellary	5,547	10	43	447	146	189	478	1,313	2	356	25	3	100	..	484	1,797	3
Anantapur ..	14,841	128	161	468	312	3,125	1,099	5,293	4	902	115	2	331	..	1,350	6,643	4
Cuddapah	13,661	883	217	379	45	452	860	2,836	2	754	76	9	1,263	..	2,102	4,938	4
Nellore	6,974	131	55	309	10	..	375	880	1	634	465	8	134	..	1,241	2,121	3
Chingleput ..	4,117	74	180	561	26	57	430	1,328	3	991	133	13	187	..	1,324	2,652	6
South Arcot ..	11,693	137	215	58	11	..	341	762	1	1,623	488	2	13	..	2,076	2,838	2
North Arcot ..	7,814	198	101	481	..	394	5	1,179	2	1,589	88	6	485	..	2,118	3,297	4
Salem	11,396	57	33	92	2	22	215	421	..	306	96	8	238	..	648	1,069	1
Coimbatore ..	13,802	55	339	132	210	116	1,408	2,260	2	1,040	1,083	14	570	..	2,707	4,967	4
Trichinopoly ..	11,639	35	212	164	2	94	800	1,307	1	2,482	760	17	173	..	3,432	4,739	4
Tanjóre	7,047	..	11	15	1	13	64	104	..	2,153	771	8	19	..	2,951	3,055	4
Madura	7,114	77	292	280	136	272	2,477	3,534	5	3,502	103	17	248	..	3,870	7,404	10
Tinnevelly ..	10,857	19	61	55	33	507	380	1,055	1	6,024	125	6	485	..	6,640	7,695	7
Nilgiris	81	..	..	..	..	1	..	1	..	13	11	..	4	..	28	29	4
Malabar	665	..	8	..	..	6	4	18	..	236	10	1	112	..	359	377	6
South Canara ..	108	..	1	..	1	..	..	2	..	15	1	..	16	..	32	34	3
Total ..	142,182	2,530	2,428	4,182	3,023	7,164	11,223	30,550	2·1	24,381	4,582	138	5,404	..	34,505	65,055	4·6
In Zemindaris.																	
Vizagapatam ..	Not available	153	471	208	266	110	235	1,443	..	249	155	8	257	..	669	2,112	..
Nellore		..	2	..	..	..	29	31	..	..	..	2	7	..	9	40	..
North Arcot ..		17	..	13	..	21	..	51	..	754	167	7	98	..	1,026	1,077	..
Total ..	..	170	473	221	266	131	264	1,525	..	1,003	322	17	362	..	1,704	3,229	..
Grand Total ..	142,182	2,700	2,901	4,403	3,289	7,295	11,487	32,075	..	25,384	4,904	155	5,766	..	36,209	68,284	..

Statistics of mortality among horses and ponies in the Presidency of Madras during the year 1893–94.

Districts.	Total stock by latest census in hundreds.	Number of deaths due to diseases.						Total.		Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and Dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	* 2	..	3	..	1	..	2	6	30	..	1	1	1	..	3	9	45
Vizagapatam ..	2	..	1	..	..	..	..	1	5	2	1	..	..	..	3	4	20
Gódávari	26	..	..	3	..	..	12	15	6	26	..	..	11	..	37	52	20
Kistna	33	..	..	5	..	..	10	15	5	71	3	..	5	..	79	94	28
Kurnool	31	..	1	3	..	..	64	68	22	22	4	..	47	..	73	141	46
Bellary	37	..	1	3	..	..	16	20	5	12	2	..	15	..	29	49	13
Anantapur	25	..	1	..	..	..	31	32	13	10	1	1	25	..	37	69	28
Cuddapah	17	..	..	2	..	..	4	6	4	8	..	..	41	..	49	55	32
Nellore	3	..	..	..	..	..	1	1	3	4	3	..	1	..	8	9	30
Chingleput	11	..	5	1	..	..	5	11	10	30	3	1	..	..	34	45	41
South Arcot	31	..	..	..	..	..	1	1	..	9	3	..	..	..	12	13	4
North Arcot	16	..	1	..	..	..	..	1	1	9	..	..	1	..	10	11	7
Salem	54	..	..	1	..	..	1	2	..	..	1	..	4	..	5	7	1
Coimbatore	49	..	..	3	..	..	5	8	2	12	..	..	11	..	23	31	6
Trichinopoly	8	..	1	1	..	..	8	10	13	1	..	1	..	..	2	12	15
Tanjore	14	..	..	..	..	..	1	1	1	22	3	..	..	..	25	26	19
Madura	* 17	..	..	15	..	..	11	26	15	22	4	..	28	..	54	80	47
Tinnevelly	6	..	..	..	..	..	..	..	..	7	..	..	1	..	8	8	13
Nilgiris	14	..	..	..	..	..	..	..	..	27	3	..	18	..	48	48	34
Malabar	9	..	..	..	..	..	2	2	2	4	..	..	..	..	4	6	7
South Canara ..	2	..	..	..	..	..	..	..	..	8	1	..	1	..	10	10	50
Total ..	407	..	14	37	1	..	174	226	5·6	306	33	4	210	..	553	779	19·1
In Zemindaris.																	
Vizagapatam ..	Not available.	..	3	..	..	..	..	3	..	1	..	..	..	..	1	4	..
Nellore		..	..	..	..	..	1	1	..	..	..	..	1	..	1	2	..
North Arcot ..		..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..
Total ..	..	..	3	..	..	..	1	4	..	2	..	..	1	..	3	7	..
Grand Total ..	..	..	17	37	1	..	175	230	..	308	33	4	211	..	556	786	..

* Last year's figure has been entered as no information is available as to the stock.

Resolution of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), dated 12th September 1894, No. 376.

The Board begs to submit the accompanying report on the operations of the Department of Land Records and Agriculture during 1893–94 for the information of Government.

2. The Director was absent on privilege leave for three months from May to July 1893 and was on deputation as the Madras Member of Viceregal Legislative Council from the last week of December 1893 to April 1894. Mr. E. Gibson was in charge of the Department during these periods.

3. The Deputy Director, Agricultural Branch, was employed on short tours in connection with the pony shows at Tiruppúr and Hosúr, and for selecting sites for Farm schools. He also went on tours to Vellore and Rajahmundry for the purpose of collecting information required by the Hemp Drugs Commission in regard to the cultivation of hemp and ganja in the Presidency, and accompanied Dr. Leather, the Agricultural Chemist of the Government of India, in his tours in Yercaud, Coimbatore, Bellary and Rajahmundry. When at Madras, he was employed in the Central Office on secretariat work.

The office of the Deputy Director of Land Records was held by Mr. Wynch up to 5th February 1894, on which date he was succeeded by Mr. Cobb.

(True Extract.)

(Signed) P. RAJARATNA MUDALIAR,
Secretary.

Order—dated 10th October 1894, No. 720, Revenue.

Miscellaneous.

The above Report on the operations of the Department of Land Records and Agriculture for the year 1893–94 was received in the Government office on the 17th September (a revised copy of the same being submitted on the 24th idem). The date prescribed for the submission of this report to Government is September 1, and it is important that this date should be carefully observed, in order that the Government may review and forward the report to the Government of India by the 1st October.

2. In reviewing the operations of 1892–93, the Government remarked that the issue of definite instructions in regard to the preparation of these reports would be postponed, pending the receipt of the orders of the Government of India on the recommendations made by the Agricultural Conference held at Simla in October 1893. The proposals of this Conference being still under the consideration of the Supreme Government, no change has been made in the form previously adopted.

3. The work entrusted to the Deputy Director of Land Records during the year is detailed in paragraph 2 of the report. This appointment was sanctioned by the Secretary of State in March 1891, and was to be provisional for a period of five years, of which three years have now elapsed. A report on the results of the new appointment is due from the Board in September 1895.

4. The arrangements made by the Superintendent, Revenue Survey, for the survey training of Karnams and Revenue Inspectors, and the assistance rendered by these officers in connection with survey and re-survey work during the year, have already been noticed in the review of the report on the administration of the Survey Department for 1893–94.

5. The Government is glad to note that the progress made during the year under review in the compilation of village registers and firka books was satisfactory, and that the preparation of the statistical atlas for the Presidency has at length been completed.

6. The returns of the mortality among live-stock show that the season was favorable to cattle of all kinds, the total loss from disease having been 25 per cent. less than the average of the five preceding years. It is observed that the number of

deaths from natural decay was especially heavy in Chingleput, Tanjore, Malabar and South Canara, while the rate *per mille* of so-called natural deaths on the Nilgiris (30·6) was enormously greater than in any other district.

7. A special report on the administration of the Civil Veterinary Department was reviewed in G.O., dated 25th July 1894, No. 547. The results of the Pony-breeding operations have also been separately reported upon.

8. As already stated, the Government of India have not yet passed orders on the recommendations of the Simla Agricultural Conference, and pending the receipt of these orders no definite action can be taken in the matter of agricultural reform in this Presidency. Practical enquiry is, however, hampered by the present condition of Imperial and Provincial finances, and the establishment of experimental farms has for this reason been unavoidably postponed.

(True Extract.)

(Signed) E. GIBSON,
Ag. Secretary to Government.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1894-95.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1895.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1894-95.

Resolution of the Board of Revenue—dated 27th August 1895, No. 272.

The Board begs to submit its report on the operations of the Department of Land Records and Agriculture during 1894–95 for the information of Government. With reference to the remarks of Government in paragraph 2 of its review of the report for 1893–94, the Acting Director has not ventured to depart from the model of former reports, though the contents under several of the heads largely consist of bald and unedifying excerpts from the Survey, Jamabandi, Public Works, Railway, Loans Acts and Trade Reports on subjects which are duly treated of either separately in the Land Records Department or in the reports of the departments to which the subjects belong. It would seem possible and desirable greatly to abridge the report by confining it to heads I, V and VI, and excluding all matter sufficiently dealt with in other departmental reports.

2. The permanent Director, the Hon'ble Mr. H. F. Clogstoun, returned in April 1894 from Calcutta, whither he had been deputed as a Member of the Viceregal Legislative Council, and continued in charge of the department till about the close of November. He then went again to Calcutta to attend the Viceregal Council, and thence proceeded to Europe on furlough. He was succeeded in office by Mr. H. M. Winterbotham, who remained in charge of the department until the close of the year.

3. Mr. Cobb was in charge of the office of the Deputy Director, Land Records, from the commencement of the official year till the end of November 1894, when he was transferred on other duty. On his transfer, the Deputy Director in the Agricultural Branch was directed to take charge of the Land Record Branch also. Mr. Benson has accordingly been in charge of both branches since December 1894. As Deputy Director of Agriculture he made two short tours, one to Coimbatore to attend the pony show held at Tiruppúr in May 1894, and also for the selection of a site for a Farm school, and the second to Bellary in connection with the enquiries regarding the use of iron ploughs in that district. From the end of July 1894 he was absent on privilege leave for three months. From January to March 1895 he was on tour in connection with Land Record duties.

I.—ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

4. The Deputy Director of Land Records (Mr. Cobb) was on tour in the Vizagapatam district during April when he inspected the taluk and village accounts of Sarvasiddhi taluk. At the beginning of May, he proceeded on three months' privilege leave and returned about the beginning of August. During the interim, the Secretary to the Commissioner of Revenue Settlement was in charge of the office. Mr. Cobb on his return paid a brief visit to Trichinopoly to study the system on which the revision of the settlement of the district was to be carried out, and was afterwards deputed to the Kurnool district to institute enquiries in connection with the approaching resettlement of a portion thereof. He was engaged on this enquiry till the end of November, when he submitted a report on the resettlement of 143 villages in which the settlement period was drawing to a close (*vide* Board's Proceedings, dated 8th February 1895, No. 28). During his stay in Kurnool he also reviewed the reports on the working of the new form of diary prescribed for Revenue Inspectors. During the remainder of the year, the Deputy Director of Agriculture, who was placed in charge of the Land Records Branch, was relieved of all work connected with resettlement, in accordance with Government Order, No. 701, dated 27th September 1894. In January, February and March 1895, Mr. Benson was on tour in Bellary, Anantapur, North Arcot and Salem districts, and was engaged chiefly in the inspection of village and taluk accounts. Salem was visited by him in connection with his agricultural duties, which also engaged part of his time in Bellary and Anantapur.

5. A proposal made by the Land Revenue Commissioners that a special officer should be appointed to revise the manuals of village and taluk accounts was rejected by Government, and the duty was entrusted to Mr. Benson.

6. The training in survey of the karnams (village accountants) of nine districts was accomplished in 1893–94. Those of the remaining thirteen districts, noted on the margin, were put through the prescribed course during the year under report. This completed the training of the karnams of Government villages throughout the Presidency.

	Number of karnams.
Ganjám	357
Vizagapatam	162
Gódávari	* 311
Kistna	* 655
Nellore	580
Anantapur	490
Kurnool	665
Bellary	523
Cuddapah	674
North Arcot	956
Nilgiris	24
Coimbatore	852
Tanjore	1,496
Total ...	7,745

* Exclusive in both cases of the karnams in five taluks, who were trained in survey before the resurvey of the taluks was commenced.

7. Permanent District Surveyors for the maintenance and correction of village maps and survey records and for the supervision of the karnams' work in replacing boundary stones, and sub-dividing survey fields, were at work during the year in the five districts of Chingleput, South Arcot, Salem, Madura and Tinnevelly, and the Superintendent of Survey submitted a scheme, based on the experience gained in these five districts, for extending the system to the other districts of the Presidency. To prevent the karnams from forgetting what they have been taught and to keep them in practice, arrangements have also been made to hold annual Survey schools in each taluk of the Presidency, in future. Under this scheme, which has since † been sanctioned by Government, a Survey school, lasting for 10 or 15 days, will be held at the head-quarters of each taluk, sometime between 1st August and 20th December, when there is no jamabandi or collection work. The Tahsildar will be the officer in charge of the school, with the District Surveyor as chief instructor, and the Revenue Inspectors as instructors for the karnams of their firkas. The karnams will bring up their survey instruments, records and accounts, and their knowledge of surveying and the manner in which they have plotted fields and subdivisions in their field measurement books will be tested. A Survey officer will visit

† G.O., Mis. No. 1592, dated 23rd April 1895, circulated with Board's Proceedings, dated 3rd May 1895, No. 107.

at least 15 schools every year, remaining not less than five days at each, the number of schools being apportioned amongst the Survey officers so that each may attend every school in his division once in two years. Such schools as are not inspected by the Survey officer will be inspected by the Divisional officer. Inspecting officers will personally examine as many karnams as possible and report the result of their examination to the Collector for the information of the Board.

8. Out of the 619 Revenue Inspectors in the Presidency, 592 are reported to have undergone training in survey. Only six posts were held by men who had either been exempted from passing the test, or who continued to draw the old scale of pay. Of the remaining 21 posts, two were vacant and the others were held by men who had not received survey training. Eight Inspectors out of thirty in the backward district of Kurnool had not been through the course.

9. The resurvey of the Trichinopoly district was completed during the year, the demarcation, measurement and plotting being done by the karnams under the supervision of the Survey Department. The resurvey of Kistna, Gódávari and Salem is proceeding satisfactorily on the same method. The area to be resurveyed in the four districts was found by recent calculation to be 9,889 square miles, not 10,230 square miles as reported last year. At the end of 1894–95, 8,101 square miles had been resurveyed, of which 2,327 square miles were completed during 1894–95.

II.—ANALYSIS OF DISTRICTS.

10. The village statistical registers and firka books, which are intended to furnish a continuous record of the condition of each village and to serve as a basis for district analysis, have been written up for fasli 1302 (1892–93) in thirteen districts, and the task is nearly finished in Kurnool, Tanjore, Trichinopoly and Tinnevelly. The work is said to have been delayed in Madura and Nilgiris owing to delay in the receipt of the vernacular translations of the revised instructions for the preparation of these registers. The explanation is hardly satisfactory, considering that the instructions did not differ on any material point from the orders previously in force, and that in the other districts the want of the translations did not retard the preparation of the registers. The Collectors have been asked to push on the work and to report its completion. The subjoined table shows the work remaining to be done for fasli 1302 :—

Districts.	Number of villages					Remarks.
	In the district.	For which village registers still remain to be		For which firka books still remain to be		
		Prepared.	Checked.	Prepared.	Checked.	
Kurnool	788	..	..	2	* 45	* Two in Pattikonda and 43 in Sirvel.
Tanjore	3,604	Complete except in Mannárgudi where firka books are not ready.				
Trichinopoly	1,400	65	65 ø	65	65	In Trichinopoly and Udaiyárpálaiyam taluks.
Madura	896	†	..	..	..	† Not commenced for want of revised instructions.
Tinnevelly	1,099	..	2	Completed.		
Nilgiris	36	†	..	..	..	

Information as to the work done in regard to fasli 1303 (1893–94) will not be available for all the districts until the receipt of the annual settlement reports in October next. From the reports received to date, it would seem that the posting and checking of the above registers has been completed, or is well advanced in Vizagapatam, Nellore, Bellary, Kurnool, Anantapur, Tinnevelly and Salem. In Trichinopoly, the work is at a stand, all karnams being fully occupied in preparing accounts

for the resettlement of the district. Particulars of the progress so far as known are given below :—

Districts.	Number of villages (Government and inam)					Remarks.
	In the district.	For which village registers have been		For which firka books have been		
		Prepared.	Checked.	Prepared.	Checked.	
Vizagapatam	201	Posting in Golgonda complete and in Sarvasiddhi in progress ; in Palkonda not taken up yet though ordered in Board's Proceedings, No. 7375, dated 3rd December 1894.				
Kurnool	788	599	528	505	415	The posting and checking of village registers and firka books were not taken up in Nandyal, Koilkuntla and Sirvel taluks.
Bellary	985	985	923	985	932	Six villages in Hospet and 56 in Kudligi are to be posted.
Anantapur	973	Completed in all the taluks except Kalyandrug where 32 villages remain.		Completed in all the taluks except Anantapur and Kalyandrug where 13 and 35 villages, respectively, remain.		
Nellore	931	Completed.		Completed.		
Trichinopoly	1,400	376	376	376	376	In Trichinopoly taluk alone, where also 61 villages remain.
Salem	2,806	2,793	2,793	..	* 2,369	
Tinnevelly	1,099	1,086	1,022	†	†	

N.B.—Reports not received from other districts.

* Have to be checked in 437 villages of Uttangarai taluk.

† Out of 38 firkas in the district, books for 19 firkas are said to have been completed.

11. Reports on the economic condition of the districts as disclosed by examination of the village registers were received during the year from the districts noted in the margin, and were submitted to Government with brief reviews by the Board.

Vizagapatam—B.P., 17th Apl. 1894, No. 158, & 18th Feb. 1895, No. 39.
Cuddapah— „ 18th Feb. 1895, „ 40.
Bellary— „ 17th Nov. 1894, „ 481.
Kurnool— „ 15th Feb. 1895, „ 36.
Nellore— „ 9th May 1894, „ 186, & 13th Feb. 1895, No. 34.
North Arcot— „ 28th Nov. „ „ 505, & 2nd „ „ 20.
Tanjore— „ 5th Dec. „ „ 515.
Trichinopoly— „ 11th Mar. 1895, „ 61.
Coimbatore— „ 23rd Nov. 1894, „ 498.
Nilgiris— „ 14th Mar. 1895, „ 65.

It is noticeable that these reports have already contrived to establish themselves in the long list of annual reports which Collectors have to submit, although the proposal to call for them was expressly disapproved by Government in paragraph 3 of Government Order, No. 685, Revenue, dated 23rd August 1890. So far as these reports deal with the character and condition of irrigation sources, the extent of culturable and unculturable waste, variations in holdings, the number and condition of the flocks and herds, the ease or otherwise with which the land revenue is collected, and the health of man and beast, they trespass on the province of the administration and jamabandi reports, which should give all the information on these subjects which it is possible to compress into a few lines. Judging from the specimens already submitted and the Board's reviews thereof, the so-called economic reports do not promise to be of any practical value, although much time and labour is bestowed on their preparation ; and the Board, as at present constituted, is of opinion that their submission should be dispensed with and that the orders of Government above quoted should be reiterated.

12. The statistical atlas has been completed and only awaits the completion of the maps to allow of its publication.

III.—COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

13. No difficulty has been experienced in the collection of the revenue in any part of the Presidency. The instalments for the payment of the revenue were revised

in 1889–90 so as to afford ample time to the ryots to sell their produce before being called on to pay the Government dues. In view to give further relief to the ryots and to lessen the work of collection, the Board in its Proceedings, dated 16th February 1894, No. 90, recommended that the December instalment should everywhere be abolished and the revenue made payable in three instalments, the first beginning in January in some districts and in February in others, the first and third being 4 annas each and the second 8 annas. The Government called for a special report as to the advisability of having an 8-anna instalment. A majority of the Collectors consulted were opposed to any change, partly on the ground that the present system has worked well, and partly because a single instalment of 8 annas was likely to press hard on the poorer ryots. The Board, in submitting these reports, adhered in the main to the proposals already made by it. No orders have yet been passed on the subject by Government.

B.P., dated 21st November 1894, No. 487-A.

IV.—MEASURES OF PROTECTION.

14. *Extension of communications.*—The East Coast Railway has been opened for public traffic as far as Berhampur, a total length of 400 miles.

The Nilgiri Railway (16 miles) is practically at a standstill owing to the Company having gone into liquidation.

The Madras–Ennore Railway (10 miles) was sanctioned and is in hand. The Ennore–Bezwada section (265 miles) of the East Coast Railway has also been sanctioned and work will be started immediately.

Surveys have been made for railways from—

	MILES.
Arsikere to Mangalore	137
Tinnevelly–Quilon	106
Calicut–Cannanore	52
Shoranur–Cochin	61
Madura–Pamban	102

15. *Advances to Agriculturists.*—The loans granted during the year under report under the Land Improvement and Agriculturists' Loans Acts amounted to Rs. 2,79,591 against Rs. 4,50,921 advanced in 1893–94, and Rs. 22,75,159 advanced in 1892–93. The falling off in the demand for State loans has been great compared with the preceding years and is attributable partly to the large sums already advanced, but mainly to the improvement in the seasons since the close of the distress in 1892. More than 77 per cent. of the disbursements were made in Coimbatore, North Arcot, South Arcot, Tinnevelly and Kurnool.

The following table shows the amounts advanced under the two Acts during each of the past five years:—

Years.	Budget allotment under both Acts.	Advances made under		Total advances.
		The Land Improvement Loans Act.	The Agriculturists' Loans Act.	
	RS.	RS.	RS.	RS.
1890-91	2,41,900	2,27,942	43,562	2,71,504
1891-92	13,89,000	15,28,407	1,57,258	16,85,665
1892-93	23,00,000	20,41,809	2,33,350	22,75,159
1893-94	10,00,000	* 4,40,312	* 10,609	4,50,921
1894-95	7,00,000	2,63,709	15,882	2,79,591

* The increase over the figures entered in the report for 1893–94 is due to adjustments made by the Accountant-General.

16. *Irrigation.*—Good progress was made on the Rushikulya works in Ganjám and on the Periyár project in Madura, the expenditure incurred on them being Rs. 3·11 lakhs and Rs. 9·60 lakhs, respectively, which raises the total outlay up to

the end of 1894–95 to over Rs. 36·80 lakhs and 73·56 lakhs, respectively. The whole length of the Rushikulya canal was opened for irrigation in August 1894 and the area irrigated during the year was 23,195 acres. On the Periyar works, the main dam was raised to an average height from 68 to 115 feet above the bed of the river, and 36 miles of main canal and 70¾ miles of branch channels were completed. On improvements to the Kistna delta system, Rs. 4·08 lakhs were spent during the year, raising the total expenditure to Rs. 108·34 lakhs.

17. *Minor Irrigation.*—The minor irrigation works under the charge of the Revenue Department number over 30,000 having an irrigable area of about 1½ million acres. The amount sanctioned for their repairs during the year was four and-a-half lakhs of rupees, out of which over four lakhs were actually expended.

V.—AGRICULTURAL EXPERIMENTS.

18. *Agricultural education.*—Government issued orders early in the year regarding the reorganization of the Agricultural College, and placed holders of the Agricultural diploma on a level with graduates, so far as employment in the public service is concerned, by allowing them the privilege of appearing for the Revenue and Criminal Higher examinations. It is as yet too soon to predict what effect this concession will have in increasing the number of students. Under the orders of Government, the results of the year's working of the college, as shown by the examinations held in April last, were not included in the college report for 1894–95. A suggestion by Government that a special course in Agriculture should be prescribed as a training for Revenue Inspectors was under discussion during the year, and was finally pronounced impracticable. A committee has recently been appointed to consider and report on the revision of the course of training in Agricultural Engineering and Land Survey and Levelling.

19. The Agricultural Chemist joined the Board of Examiners in Agriculture for the diploma examination and set papers in Organic and Agricultural Chemistry. Arrangements were also made for the Assistant Agricultural Chemist to deliver a course of lectures on Agricultural Chemistry at the college from the middle of November to the end of December in each year.

20. The college farm continued to be managed chiefly as a dairy farm, a ready sale being found locally for the milk produced. The season was not a very favourable one.

21 *Dairy experiments.*—With a view to continue the experiments conducted at Saidapet in 1892 for the purpose of comparing European and Native dairy methods, enquiries were made during the year both in the North-West Provinces and Bombay to secure the services of a thoroughly trained dairy-man. The Government of Bombay, however, suggested that some employé should be deputed to learn dairy management at the Poona farm. The matter is under consideration, and Government called for a report as to whether the farm at Saidapet could be developed so as to supply milk and butter to the hospitals and troops in Madras. The report called for from the Principal of the college has not yet been received.

22. *School farms.*—Although the Government of India consented to the opening of 2 or 3 farms for experimental purposes, no action was taken as the Local Government was of opinion that no definite orders could be passed in the matter until the views of the Government of India on the subject of agricultural education and experiment are known. These orders are awaited.

23. *Experimental crops.*—Owing to the late date on which it was decided to revert to the old system of offering prizes for the best early grown barley on the Nilgiris, the early crops were already either harvested or being harvested and no show could be held during the year.

An experiment in the cultivation of oats from the Cape was conducted on the Nilgiris, and is reported to have been successful, but particulars are wanting owing to the absence in England of the gentleman who undertook the experiment. No

reports of the results of the further experiments with new varieties of potatoes on the Nilgiris, alluded to in the previous year's report have as yet been received. The Collector of Coimbatore reported that some Seoni wheat experimentally grown at the Central Jail yielded well, and he was asked to distribute a portion of the wheat raised at the jail among ryots who might be fit and willing to make further experiments with it. The report of one such experiment showed that the yield obtained did not come up to that expected from local varieties. A further supply of Seoni pissi seed wheat was obtained during the year and distributed to three Collectors for experimental cultivation. The Collector of Madura, who has alone reported the results, states that the yield was satisfactory, and the sample submitted by him appears to be of good quality. It is proposed to continue the experiment on the Lower Palnis. The reports from the other two Collectors have been called for.

24. *Bulletins.*—Only one bulletin was issued during the year, viz., No. 31, on the care and management of farm-manure in Southern India. This is being translated into the vernaculars for general distribution.

25. *Agricultural enquiry.*—The enquiry into the cultivation of cotton and indigo which was begun in 1893–94 was continued during the year by the Sub-Assistant Director in the Ceded districts and Kistna.

The Agricultural Inspector employed in Bellary in connection with the use of heavy iron ploughs collected some useful information regarding the growth of sugar-cane and the manufacture of sugar in that district.

26. Reports on the experiments made in fasli 1303 (1893–94) by the Divisional officers and Tahsildars with a view to ascertain the outturn of crops were duly received, but with two exceptions, the Collectors merely forwarded the reports, to the Board without attempting to review them. On examination of the reports it was found that in nearly all cases, the instructions for conducting the experiments had either been misunderstood or not properly carried out, and that the results were quite untrustworthy. A full review of the experiments, pointing out the errors and omissions in conducting them, was communicated in April last to all Collectors, and it is to be hoped that greater care and intelligence in conducting the experiments will be displayed in future; but the truth is that these experiments in crop-outturns, which have generally to be made in what for Revenue officials are the busiest seasons of the year, require an amount of time and scrupulous supervision which the Tahsildars and Divisional officers can ill-afford to bestow.

Many of the experiments necessarily extend over several days; facilities for guarding the grain in the interval are generally wanting; a desire on the part of the cultivators that the produce should be under-rated is almost universal; the attention of the experimenters is often diverted by more pressing work; and it may be doubted, under these conditions, whether the glaring discrepancies and inconsistencies noticeable in the results of last year's experiments when compared together will ever be avoided.

27. *Agricultural implements and machines.*—In Bellary and Anantapur, the active interest in heavy iron ploughs for clearing nuth-grass from black-cotton soil continued and increased. To encourage the ryots to use these ploughs, and to assist in the disposal of applications for loans under the Agriculturists' Loans Act, two Agricultural Inspectors were employed in these districts throughout the season, and a third for a short time after Christmas. The difficulty of getting the iron ploughs repaired has not yet been altogether got over, but wherever there is a fair number in use, the native smiths are finding it worth while to provide themselves with the necessary tools, whilst in Bellary town, a very active repairing business is carried on by several firms of Muhammadan blacksmiths.

Water-lifts designed to supersede the ordinary country lift in which a bucket is raised and lowered by a yoke of bullocks working on an inclined plane were brought out during the year by M.R.Ry. C. K. Subba Row and Messrs. Sultan and Co., Madras. Later in the year Mr. E. W. Stoney of the Madras Railway Company brought to the notice of Government a lift which he had patented, and the

Government ordered one of them to be purchased, and appointed a committee to conduct a trial of these three lifts and report the result. None of the machines was ready for experiment till after the close of the year.

28. *Insect pests.*—The year offers no occasion for remark under this head.

29. *Societies.*—The permanent Director continued to be a member of the Committee of the Madras Agri-Horticultural Society until he proceeded to Calcutta in December 1894, and the Society has recently intimated that, in accordance with the desire of the Government of India, the Director will in future be an *ex-officio* member of the Committee. The total income of the Society from all sources amounted to Rs. 10,546, of which Rs. 4,000 was from Government grants, and Rs. 1,865 from subscriptions. The number of members fell off by 16, though there was an addition of 14 members during the year. The annual flower show was held as usual in February 1894 and was well attended. It was a fair average show considering the preceding dry weather both at Madras and Bangalore. The library was slightly strengthened and several new plants were added to the gardens. The usual system of distributing seeds and plants was continued.

VI.—CATTLE-BREEDING AND VETERINARY ESTABLISHMENTS.

30. *Civil Veterinary Department.*—Veterinary-Lieutenant Turnbull remained on duty in the Presidency as Superintendent, Civil Veterinary Department, until 17th October 1894, when he was transferred to North India. During the 200 days that he was on duty, he spent 40 days on tour. He delivered a course of lectures on Veterinary Science in the College of Agriculture at Saidapet. From 18th October to 30th November 1894, the post of Superintendent was vacant. Veterinary-Lieutenant Harris joined on the latter date. Up to the end of the year he spent nine days on tour and delivered a short course of lectures at Saidapet. Mr. Turnbull inspected the stallions working in Salem and Coimbatore and was present at the pony show held at Tiruppúr in May 1894. He also visited Kollegal to make enquiries regarding a proposed private mule-breeding establishment. Proposals were submitted early in the year for filling up the appointment of Deputy Superintendent, which were sanctioned by Government, and Farrier-Major Mannas, who was appointed to the post, joined in August and remained on duty during the rest of the year. A proposal to appoint another officer to assist the Superintendent in district work was approved of by the Government, but still awaits the sanction of the Government of India. Early in the year two Stock Inspectors were selected and sent to the Bombay Veterinary College for a one-year course. The course was completed in May last and the two Inspectors obtained the Diploma of the College. The remaining Inspectors were chiefly employed in miscellaneous work during the year pending settlement of arrangements for carrying on the work of the Bacteriological Survey, in preparation for which they underwent a special course of training under Mr. Turnbull, who, before he left Madras, reported them to be fit to carry on the work. The scheme was matured towards the end of the year and the Inspectors have now been posted to district work. A number of the Inspectors having become eligible for promotion by length of service, a scheme for an examination that they should undergo before being promoted was prepared by a committee during the year and has since been brought into force.

Orders were issued during the year regarding the institution of a special veterinary class in connection with the College of Agriculture at Saidapet, which class the Government decided should be opened there from the 1st April 1895. Owing however to the non-receipt of the sanction of the Government of India to the appointment of a Special Assistant at the college for carrying on the work, nothing has yet been done in the matter. The scheme of study proposed with reference to the orders of Government establishing the class has been prepared, but has not yet been approved by Government pending the receipt of the orders above mentioned.

31. *Pony-breeding.*—As usual these operations were confined to the Salem and Coimbatore districts. At the commencement of the year there were three stallions at work in the former, and five in the latter, district. One stallion was found unfit for further duty and was sold by auction. Four new stallions were purchased during May, one of which was sent to Salem and three to Coimbatore. In Salem, 116 tats

were castrated, but in Coimbatore, no castration work was done owing to the want of a salustri. One has since been appointed. In all 455 mares,—281 in Coimbatore and 174 in Salem,—were covered during the year, giving an average of 44 mares per stallion in Salem and 35 mares per stallion in Coimbatore. Sixty mares per stallion annually is the prescribed maximum. The results of the covering of the previous year were the worst recorded * during the past five years, especially in Salem. In May 1894 a very successful pony show was held at Tiruppúr in the Coimbatore district. The results have been reported to Government in Board's Proceedings, dated 7th June 1894, No. 234.

* B.P., dated 29th July 1895, No. 231.

32. *Mule-breeding.*—In December 1893, the Collector of Coimbatore forwarded an application from Mr. Morris, a coffee planter on the Kollegal Hills, who offered to undertake mule-breeding if the Government would assist him at the outset by providing him with three Piedmont donkey stallions and would also agree to purchase from him all the mules bred that came up to regulation height and measurement at a maximum price of Rs. 150 when they were $3\frac{1}{2}$ years old. After some correspondence Mr. Morris accepted the conditions laid down by Government, and the Government of India was addressed as to the supply of three donkey stallions. The Government of India, in reply, offered to place one donkey at the disposal of Mr. Morris provided he undertook to feed the stallion and maintain 60 good mares, whilst as to the purchase of mules from him, it was of opinion that it could pay on an average Rs. 150 each mule up to regulation requirements for transport purposes. This offer was rejected by Mr. Morris unless the Government would agree also to purchase any mules that might turn out suitable for ordnance purposes at the average price payable for their class and stamp. No further reply has been received from the Government of India. In March last the Government, in deference to the wishes of the Government of India, directed the Board of Revenue to draw up a scheme for experimental mule-breeding in this Presidency and the Superintendent, Civil Veterinary Department, was called upon to submit proposals. The scheme is now under the consideration of Government.

33. *Mortality amongst live-stock.*—In the subjoined table the number of deaths amongst live-stock reported by the village establishment during 1894–95 is shown in comparison with the numbers reported in the previous year, and with the average for the quinquenniem ending in 1893–94.

Causes of death.	Number amongst cattle.			Number amongst sheep and goats.			Number amongst horses and ponies.		
	Average up to 1893–94.	In 1893–94.	In 1894–95.	Average up to 1893–94.	In 1893–94.	In 1894–95.	Average up to 1893–94.	In 1893–94.	In 1894–95.
Diseases.									
Rinderpest	19,368	13,155	13,974	2,660	2,700	2,715	..	..	..
Diarrhœa and dysentery	25,517	18,104	9,825	4,235	2,901	2,096	13	17	4
Total	44,885	31,259	23,799	6,895	5,601	4,811	13	17	4
Anthrax	19,227	22,405	16,123	5,110	4,403	3,241	19	37	13
Foot and Mouth diseases	6,986	8,239	7,545	2,096	3,289	2,895	..	1	..
Variola	2,377	1,523	1,806	6,314	7,295	15,313	3	..	..
All others	28,809	28,089	35,947	12,635	11,487	11,943	141	175	155
Total from diseases	102,284	91,515	85,220	33,050	32,075	38,203	176	230	172
Other causes.									
Natural decay	.	124,096	135,135	28,422	25,384	22,319	341	308	307
Accident	..	6,037	5,339	5,249	4,904	3,088	42	33	30
Snake-bite	2,314	2,445	2,597	203	155	175	6	4	16
Wild animals	10,378	11,497	10,750	6,742	5,766	4,955	157	211	204
Criminal poisoning	20	21	35	..	..	..	..	..	..
Total from other causes	12,712	144,096	153,856	40,616	36,209	30,537	546	556	557
Grand Total	114,996	235,611	239,076	73,666	68,284	68,740	722	786	729

34. *Losses from disease.*—The reported mortality amongst cattle from these causes exhibited a further decline on the whole, although there was a marked increase under unspecified diseases. In no district of the Presidency, except South Canara

(4,783), were very serious losses from rinderpest reported. Deaths from anthrax were nowhere numbered very numerous, nor were deaths from epizootic aptha, except in Ganjám (2,413) and Chingleput (1,262). If the latter figures can be accepted as even approximately correct, they indicate severe outbreaks. Cuddapah (8,008), Kurnool (4,391) and Gódávari (3,082) reported large numbers of deaths from diseases unspecified and it will be for the Superintendent, Civil Veterinary Department, to investigate these. Taking all diseases together, the losses for the Presidency as a whole were considerable in September and October, and then fell away rapidly.

Amongst sheep and goats, the mortality was considerably higher than in the previous year and was also above the average. The excess was solely due to very considerable losses from variola which occurred for the most part during the last three months of the year, and chiefly in the Anantapur district, whilst in Cuddapah, Tinnevelly and Bellary there were considerable losses also from this disease. Amongst sheep and goats, diseases not specified caused heavy losses in Anantapur.

Amongst horses and ponies the reported deaths from disease were as usual few in number and chiefly occurred under unspecified diseases. In the next table the death-rates from disease reported during recent years amongst each description of live-stocks are given. These figures relate solely to Government villages, for which alone statistics of stock are available. The task of registering cattle mortality forms so grievous an addition to the labours of the village officers and their means of information are so defective that the statistics are very incomplete and untrustworthy.

Year.	Horned cattle.			Sheep and goats.			Horses and ponies.		
	Number of		Death rate per mille.	Number of		Death rate per mille.	Number of		Death rate per mille.
	* Stock.	Deaths.		* Stock.	Deaths.		* Stock.	Deaths.	
1889–90	14,476	128,466	8·9	12,061	39,599	3·3	43	153	3·6
1890–91	14,959	102,097	6·8	12,467	29,977	2·4	43	199	4·6
1891–92	14,849	87,349	5·9	12,715	31,438	2·5	42	155	3·7
1892–93	14,842	101,990	7·1	13,197	32,151	2·4	40	142	3·5
1893–94	16,192	86,554	5·3	14,218	30,550	2·1	40·7	226	5·6
Average	14,964	101,291	6·8	12,932	32,743	2·5	41·7	175	4·2
1894–95	16,112	82,217	5·1	12,931	36,875	2·8	36·5	171	4·6

* Thousands.

35. *Losses from other causes.*—The attempt to register the mortality from natural causes amongst live-stock, which was revived under the orders of Government in April 1893, continued to give very bad results. Amongst cattle only 130,677 head were reported to have died a natural death in Government villages, or at about the ratio of 1 in 123, amongst sheep and goats only 21,441 or 1 in 603 ; and of horses and ponies, 303 or only 1 in 120. These results, especially as to cattle and horses and ponies show that the figures are altogether valueless. In the case of the districts noted in the margin, the registration under this heading is most markedly absurd. It must be remembered, however, that the statistics do not profess to show the number of animals slaughtered for food, and that as there is in most places a large meat-eating population, it is not to be expected that the number of animals allowed to die a natural death will be large.

—	Cattle.		Sheep and goats.	
	Stock.	Death.	Stock.	Death.
Bellary	524,064	1,132	554,652	276
Nellore	598,594	1,693	571,212	577
Salem	875,888	657	1,139,607	160
Coimbatore	1,104,969	1,857	1,380,277	674

36. The reported losses from snake-bites and from the ravages of wild animals showed a decrease as compared with the previous year. As usual the heaviest losses occurred in the West Coast districts.

Criminal poisoning was reported to have caused the death of 35 head of cattle. The information available regarding these cases is tabulated below :—

District.	Number of cattle poisoned.	Action taken.
Vizagapatam	3	These cases were dismissed for want of evidence.
Gódávari	7	In six cases the owners' suspicion was found on enquiry to be groundless and the seventh was dismissed for want of sufficient evidence.
Kistna	4	These were found to be concocted cases and the accused were acquitted accordingly.
Kurnool	3	In one case the accused was sentenced to three months' rigorous imprisonment, in another arsenic was found but the offender could not be traced; and in the third the offender was sentenced to five months' rigorous imprisonment.
Anantapur	3	In one case the accused was sentenced to two months' rigorous imprisonment; in another case the animal was found not to be poisoned but stabbed to death and the accused was sentenced to four months' rigorous imprisonment; and as regards the third, which occurred in March 1895, no report is yet received.
Cuddapah	3	In one case the result of the enquiry is not yet reported; the other two cases have been struck off as false.
Nellore	3	In two cases the accused were acquitted as the Chemical Examiner certified that the viscera contained no poison, and, with regard to the third, which occurred in August 1894, no report is yet received.
Salem	4	In one of the cases the offender could not be traced; in another the offenders were punished with two and three months' rigorous imprisonment and fine; and as regards the other two, which took place in January 1895, no report is yet received.
Coimbatore	3	In one case no steps were taken for investigation as the owner suspected nobody in particular, and, as regards the second and third, which occurred in January and March 1895, no report is yet received.
Tanjore	1	In this case the culprit was sentenced to five months' rigorous imprisonment.
Madura	1	This case took place in February 1895 and no report is yet received.
Total ..	35	

VII.—MISCELLANEOUS.

37. No change was made during the year in the number or dates of issue of crop forecasts which were all duly published on the dates shown in the subjoined statement :—

Crops.	Reports.		
	Showings.	Forecast (first).	Forecast (second).
Paddy	15th October	17th December ..	15th February.
Indigo	14th September	15th December ..	..
Gingelly, early	11th August	1st November ..	..
Do. late	22nd December	18th April ..	..
Cotton	11th August (first)	10th December ..	9th February.
	10th October (second)		

38. *Exploration for minerals.*—The exploration of the corundum areas in the Salem and Coimbatore districts alluded to in paragraph 23 of the last report was continued during the field season of 1894–95. On consideration of a preliminary report submitted by Mr. Middlemiss in August 1894, the Government came to the conclusion that the original period of two seasons fixed for his deputation to Madras was only prescribed for a small portion of the work which it is desired to carry out, and that it considered that the recess permitted was unduly extended and not regulated by local climatic conditions. The term of Mr. Middlemiss' deputation to Madras has accordingly been extended up to the spring of 1896, and his further employment is to be considered in connection with a conspectus and working plan called for by the Government of India. During the year Mr. Middlemiss completed an examination of the corundum and magnesite areas in Salem, and of the former in part of Coimbatore and since its close has submitted reports on the results.

39. *Rail-borne trade of the Presidency.*—The compilation of the returns of this trade was made in the office of the Examiner of Railway Accounts, Bombay. The

annual returns will be issued shortly with a separate review; they show that the total amount of the rail-borne trade of the Presidency during 1894–95 was the largest recorded since registration began, and was about 18½ per cent. more in volume and 24 per cent. more in value than in the previous year The increase is chiefly due to the opening up of railway communications with the Northern Circars and the ports of Cocanada and Vizagapatam. The subjoined statement gives the details of the last five years :—

Year.	Imports.		Exports.		Interval.		Total.	
	Amount. *	Value. †	Amount. *	Value. †	Amount. *	Value. †	Amount. *	Value. †
1890–91	5,353	4,43	4,306	3,70	26,983	20,26	36,642	28,39
1891–92	7,027	5,25	4,717	3,61	27,305	19,79	39,049	28,65
1892–93	7,257	5,53	5,399	4,16	24,110	20,44	36,766	30,13
1893–94	7,661	5,64	6,125	4,46	25,021	21,45	38,807	31,55
1894–95	8,645	6,66	6,571	4,65	30,802	27,85	46,018	39,16

* Thousands of maunds. † Lakhs of rupees.

40. The increase in volume and value of the trade as compared with the previous years occurred under all heads,—viz., imports, exports and internal,—the largest percentage of increase occurring in the internal trade.

The imports from other provinces amounted to 8·65 millions of maunds, of which nearly 3,705,000 maunds was coal and coke and 1,876,000 maunds grain and pulse. Compared with the previous year, there was an increase of nearly a million of maunds or 13 per cent. in volume, and 102 lakhs or nearly 18 per cent. in value. The increase is wholly due to increased imports of coal and coke from the Nizam's Dominions, nearly 3,683,000 maunds having been imported in the year against 1,554,000 maunds in the previous year. On the other hand, the imports in grain and pulse which were nearly one-half of the total trade in the previous year fell nearly to one-fifth in the year under report, the imports of grain and pulse having fallen off from 3,695,000 maunds to 1,876,000 maunds in the year.

The exports to other provinces increased nearly by 446,000 maunds or 7 per cent. in volume and by nearly 5 per cent. in value. The increase occurred in the exports of coal and coke and grain and pulse, the former being exported to Mysore from Madras and rice not in the husk (under grain and pulse) to the same province from the Deccan districts, the North Arcot and Chingleput, and the South Arcot and Tanjore blocks.

The internal trade of the Presidency increased by nearly 5,781,000 maunds or 23 per cent. in volume and by 640 lakhs or 30 per cent. in value; the increase occurring chiefly under railway plant and rolling-stock, grain and pulse, stone and lime, and oil-seeds.

41. The distribution of the total trade of the Presidency among the different blocks into which it is divided for purposes of registration is shown below :—

Internal blocks of the Presidency.	Imports.								
	1893–94.				1894–95.				
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		Percentage of increase or decrease.
			Quantity.	Percentage.			Quantity.	Percentage.	
1	2	3	4	5	6	7	8	9	10
Sea-ports.	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Madras	1,214,447	5,625,715	6,840,162	20·9	1,321,702	5,772,914	7,094,616	18·0	+ 3·7
2. Pondicherry	10,567	1,098,538	1,109,105	3·4	17,113	1,117,211	1,134,324	2·9	+ 2·3
3. Cuddalore	..	..	..	..	3,111	714,598	717,709	1·8	..
4. Negapatam	16,630	876,806	893,436	2·7	11,242	1,342,884	1,354,126	3·4	+ 51·6
5. Tuticorin	32,332	1,004,562	1,036,894	3·2	22,909	1,187,386	1,210,295	3·1	+ 16·7
6. Calicut	23,571	630,667	654,238	2·0	57,554	812,215	869,769	2·2	+ 32·9
7. Cocanada	..	..	..	..	569,864	900,221	1,470,085	3·7	..
8. Vizagapatam	..	..	..	..	3,323	799,995	803,318	2·0	..
Internal blocks.									
9. Northern Circars	47,387	54,528	101,915	0·3	239,878	1,257,315	1,497,193	3·8	+ 1,369·1
10. Kistna and Gódávari	1,816,300	304,085	2,120,385	6·5	3,512,374	279,894	3,792,268	9·6	+ 78·1
11. Nellore	5,353	293,129	298,482	0·9	..	..	..	..	..
12. Deccan districts	1,024,814	1,293,577	2,318,391	7·2	972,028	1,341,907	2,313,935	5·9	— 0·2
13. Chingleput and North Arcot	633,532	2,743,085	3,376,619	10·3	508,411	2,294,559	2,802,970	7·1	— 17·0
14. South Arcot and Tanjore	251,825	3,720,588	3,972,413	12·1	78,094	4,069,809	4,147,903	10·5	+ 4·4
15. Salem, Coimbatore and Trichinopoly	2,164,984	2,595,904	4,760,888	14·6	1,066,224	3,784,639	4,850,863	12·3	+ 1·9
16. Madura and Tinnevelly	419,204	4,779,638	5,198,842	15·9	99,939	4,393,689	4,493,628	11·4	— 13·6
17. Malabar	..	..	..	..	161,426	733,023	894,449	2·3	..
Total	7,660,946	25,020,822	32,687,768	100·0	8,645,192	30,802,259	39,447,451	100·0	+ 20·7

N.B.—1. *From 1st April* 1894.—Three ports, viz., Cuddalore, Cocanada and Vizagapatam, were added to the list of Madras sea-ports.

2. Nellore, which was a separate block in the previous years, is now split into two parts, viz., North Nellore and South Nellore, the former being added to the Kistna and Gódávari block and the latter to the Chingleput and North Arcot block.

3. Trichinopoly, which formed part of the South Arcot, Tanjore and Trichinopoly block in previous years, is now added to the Salem and Coimbatore block.

4. Malabar is separated from the Salem and Coimbatore block and made a separate block.

Internal blocks of the Presidency.	Exports.								
	1893-94.				1894-95.				
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		Percentage of increase or decrease.
			Quantity.	Percentage.			Quantity.	Percentage.	
	11	12	13	14	15	16	17	18	19
Sea-ports.	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Madras	2,758,580	3,400,060	6,158,640	19·8	3,033,410	3,705,356	6,738,766	18·0	+ 9·4
2. Pondicherry	6,090	101,846	107,936	0·3	1,482	62,870	64,353	0·2	— 40·4
3. Cuddalore	..	..	..	..	1,014	942,977	943,991	2·5	..
4. Negapatam	4,611	1,428,344	1,432,955	4·6	2,779	1,114,206	1,116,985	3·0	— 22·0
5. Tuticorin	3,519	2,590,479	2,593,998	8·3	949	1,735,606	1,736,555	4·6	— 33·0
6. Calicut	61,028	794,473	855,501	2·7	49,425	559,715	609,140	1·6	— 28·8
7. Cocanada	..	..	..	..	46,966	354,590	401,556	1·1	..
8. Vizagapatam	..	..	..	..	8,499	859,800	868,299	2·3	..
Internal blocks.									
9. Northern Circars	6,528	14,355	20,883	0·1	33,247	1,322,868	1,356,115	3·6	+ 6393·9
10. Kistna and Gódávari	398,583	469,692	868,275	2·8	666,384	1,199,614	1,865,998	5·0	+ 114·9
11. Nellore	1,140	706,136	707,276	2·3	..	..	..	..	..
12. Deccan districts	1,135,357	2,719,744	3,855,101	12·4	1,022,612	2,188,460	3,211,072	8·6	— 16·7
13. Chingleput and North Arcot	686,311	4,766,016	5,452,327	17·5	382,428	4,761,416	5,143,844	13·8	— 5·6
14. South Arcot and Tanjore	149,614	4,066,551	4,216,165	13·5	139,405	5,332,964	5,472,369	14·7	+ 29·8
15. Salem, Coimbatore and Trichinopoly	903,223	2,398,212	3,301,435	10·6	867,671	3,553,270	4,420,941	11·8	+ 33·9
16. Madura and Tinnevelly	10,330	1,564,914	1,575,244	5·1	6,129	1,886,994	1,893,123	5·1	+ 20·2
17. Malabar	..	..	..	..	308,325	1,221,552	1,529,877	4·1	..
Total	6,124,914	25,020,822	31,145,736	100·0	6,570,725	30,802,259	37,372,984	100·0	+ 20·0

N.B.—1. *From 1st April* 1894.—Three ports, viz., Cuddalore, Cocanada and Vizagapatam, were added to the list of Madras sea-ports.

2. Nellore, which was a separate block in the previous years, is now split into two parts, viz., North Nellore and South Nellore, the former being added to the Kistna and Gódávari block and the latter to the Chingleput and North Arcot block.

3. Trichinopoly, which formed part of the South Arcot, Tanjore and Trichinopoly block in previous years, is now added to the Salem and Coimbatore block.

4. Malabar is separated from the Salem and Coimbatore block and made a separate block.

42. *Road traffic.*—In accordance with the wishes of the Government of India that the registration of road traffic should be continued for a number of years at each station so as to determine average capacity of the tracts concerned, traffic was registered, during the year under review, on the same roads as in the previous year (1893–94). In Vizagapatam, however, registration at two stations, viz., Pottangi and Rayagada, which are on the Vizagapatam-Jeypore and Vizagapatam-Central Provinces roads, respectively, had been completed for three years, and two other stations on the Vizagapatam-Párvatipur road were taken up instead. The table below shows the different roads and stations where traffic was registered during 1894–95 :—

Districts.	Description of the roads.	Registering stations.	Years completed.
Tinnevelly	Tinnevelly-Trivandram	(1) Tenkási.	1889–90, 1893–94 and 1894–95.
		(2) Panakudi.	1890–91, do. do.
Madura	Madura-Ramnad	(3) Mánámadurai.	1888–89, do. do.
	Dindigul-Pollachi	(4) Palni.	1893–94 and 1894–95.
Coimbatore	Karúr and Trichinopoly to Pollachi.	(5) Dhárápuram.	1892–93, 1893–94 and 1894–95.
	Coimbatore-Malabar	(6) Pollachi.	Do. do.
Malabar	Malabar-Cochin	(7) Mangalam.	Do. do.
		(8) Chetwai.	Do. do.
		(9) Shoranur.	1893–94 and 1894–95.
	Calicut-Wynaad	(10) Malaparamba.	1892–93, 1893–94 and 1894–95.
	Calicut-South Canara	(11) Payoli Lock.	Do. do.
		(12) Quilandi.	1893–94 and 1894–95.
	Cannanore-Coorg	(13) Muttanur.	1888–89, 1893–94 and 1894–95.
South Canara ..	Mangalore, Coorg-Mysore	(14) Uppinangadi.	
		(15) Beltangodi.	1893–94 and 1894–95.
		(16) Puttur.	
Salem	Trichinopoly-Salem	(17) Námakkal.	1892–93, 1893–94 and 1894–95.
	Salem-South Arcot	(18) Near Perambalúr.	Do. do.
		(19) Atúr.	1889–90, 1893–94 and 1894–95.
Nellore	Madras-Guntúr	(20) Nayudupet.	1891–92, 1893–94 and 1894–95.
		(21) Kávali.	1893–94 and 1894–95.
		(22) Ongole.	1891–92, 1893–94 and 1894–95.
Vizagapatam ..	Vizianagram-Párvatípuram ..	(23) Párvatípuram.	1890–91 and 1894–95.
		(24) Ramabhadrapuram.	
	Vizagapatam-Central Provinces ..	(25) Gunupur.	1892–93, 1893–94 and 1894–95.
Ganjám	Ganjám-Central Provinces ..	(26) Kalingiya.	1889–90, do. do.

The results obtained will be recorded in the rail-borne trade report.

APPENDIX I.

Letter from Veterinary-Lieutenant C. B. M. HARRIS, Superintendent, Civil Veterinary Department, to the Secretary to the Commissioner of Revenue Settlement, Land Records and Agriculture, dated Madras, 25th June 1895, No. 484.

I have the honour to submit herewith a report on the work done by this department during the official year 1894–95.

2. Veterinary-Lieutenant H. P. Turnbull was in charge of the department until 17th October 1894, when he left on transfer to the North Punjab. I took charge of the post on the 30th November 1894. The department during the interval was in charge of the Secretary to the Board of Revenue (R.S., L.R. and Agri.).

A.—Pony-Breeding.

3. As the system of naming stallions gave rise to some confusion, it was resolved to identify them by numbers and they were therefore branded accordingly. I should recommend that stallions be named and numbered.

4. At the commencement of the year there were five stallions available for work at Coimbatore and there was an addition of three more about the end of May 1894. Of these, stallion No. 10, being found unfit for stud purposes, was sold at Madras by public auction.

At Salem, there were three stallions at work at the commencement of the year and there was an addition of one more at about the end of May 1894. This new stallion No. 12 worked only for 10 months, when he was found unfit for stud purposes and was therefore disposed of by public auction in May last. Thus there are at present seven stallions working in Coimbatore and three in Salem.

5. In Coimbatore, stallions Nos. 1, 2, 3, 4, 5, 9, 10 and 11 covered 54, 31, 48, 53, 40, 17, 9 and 29 mares against 51, 67, 60, 15 and 13 of the previous year. No stallion had his full complement of coverings, viz., 60, though Parfait Amour (No. 1), in spite of his comparatively long service, covered three more than the previous year; Sultan (No. 2) covered only 31 against 67 of the previous year. Work turned out by Nawab (No. 5) was much below the average, while that turned by Nos. 9 and 11 is not satisfactory, and is not accounted for by the Collector in his report.

6. As regards the results of coverings during 1893–94, it is observed that, of the total number of coverings of five stallions, namely, 206, 12 mares died, 31 were sold and untraceable, and 5 not reported and doubtful, leaving a balance of 158 coverings in which the results were known, and 27 per cent. of this number were successful against 45 per cent. of the previous year, 66 per cent. empty and 7 per cent. aborted against 45 per cent. and 8 per cent., respectively, of the previous year. The percentage of the successful coverings in the case of each stallion as compared with the previous year is as follows:—

	1893–94.	1892–93.		1893–94.	1892–93.
No. 1. Parfait Amour ...	30	31	No. 4. Rajah	8	...
„ 2. Sultan	27	62	„ 5. Nawab	25	...
„ 3. Agha	31	37			

7. The results of coverings by Parfait Amour (No. 1) and Agha (No. 3) continued to be satisfactory; while those of Sultan (No. 2), though not much below the average obtained in other Presidencies, do not compare favourably with those of the previous year, and this, I think, is due to the excessive work exacted of him in the last year. The results of Nawab (No. 5) are fair, while those of Rajah (No. 4) are unsatisfactory.

8. In the Hosúr Sub-division of the Salem district, the work turned out by stallions Nos. 6, 7, 8 and 12 was 51, 51, 52 and 20 coverings against 50, 67 and 60 of the previous year. No stallion had his full complement of mares. With the exception of stallion No. 12 the work was satisfactory. This stallion has since been sold as unfit for breeding purposes.

9. As regards the results of coverings during 1893–94—209 coverings to four stallions—seven mares died, seven were sold, 13 untraceable and 31 not reported, leaving a balance of 151 cases in which the results were known, and 16 per cent.

of this number were successful against 29 per cent. of the previous year. The percentage in the case of successful cases for each stallion as compared with 1892–93 is as follows:—

	1893–94.	1892–93.		1893–94.	1892–93.
No. 6. Abdulla	17	26	No. Padsha	21	23
„ 7. Carbon	16	50	„ 8. Ranger	30	...

10. The results of the coverings for 1893–94 were unsatisfactory. They are worse as compared with those of the previous year or those obtained in the Coimbatore district in the same year, viz., 1893–94. The Sub-Collector ascribes the poor results to the weakly condition of brood mares and want of care as to feeding and rearing on the part of owners, and I agree with him. The contrast between the brood mares and foals exhibited at the Mecheri show and those exhibited at Tiruppúr was great and is due to the fact, in my opinion, that Coimbatore has the advantage of Salem in being a more suitable breeding district.

11. The annexed statement will show the results of coverings checked by the Deputy Superintendent since his appointment in August last:—

District.	Number and name of stallion.	Actually inspected.											Information obtained.						
		Foaled.		In foal.		Empty.		Doubtful.		Aborted.			Sold.		Died.		Whereabouts not known.		
		1893–94.	1894–95.	1893–94.	1894–95.	1893–94.	1894–95.	1893–94.	1894–95.	1893–94.	1894–95.	Total.	1893–94.	1894–95.	1893–94.	1894–95.	1893–94.	1894–95.	Total.
Coimbatore.	1. Parfait Amour.	1	..	..	6	3	4	..	..	..	..	14	..	2	..	..	..	..	2
	2. Sultan ..	3	..	1	8	4	1	..	..	..	..	17	..	..	..	..	..	..	..
	3. Agha	3	..	4	..	2	2	..	..	..	..	11	..	..	..	..	..	..	..
	4. Rajah	..	..	..	2	3	1	..	..	..	..	6	..	..	1	..	..	..	1
	5. Nawab ..	..	..	1	1	6	..	..	..	..	..	8	1	..	..	..	..	..	1
	Total ..	7	..	6	17	18	8	..	..	..	..	56	1	2	1	..	..	..	4
Salem ..	6. Abdulla ..	2	..	2	13	6	2	..	..	1	1	27	1	3	..	1	1	..	6
	7. Carbon ..	2	..	..	5	8	1	..	..	1	..	17	5	3	1	..	2	..	11
	8. Ranger ..	4	..	1	7	11	1	..	..	2	1	27	2	1	2	..	..	..	5
	12. No name ..	..	..	..	3	..	..	..	..	..	1	4	..	..	..	..	..	..	..
	Total ..	8	..	3	28	25	4	..	..	4	3	75	8	7	3	1	3	..	22
	Grand Total ..	15	..	9	45	43	12	..	..	4	3	131	9	9	4	1	3	..	26

From the above it will be observed that the Deputy Superintendent checked in all, the results of 157 coverings, of which 131 were actually inspected, and of the rest, information was obtained against 238 inspected by his predecessor. The results reported by the Deputy Superintendent were verified with those reported by the Collectors and were found to agree in most instances. Enquiry as to the results of coverings appears to be more satisfactory this year than in the previous one, and it is hoped that, with the help of Stock Inspectors posted to the breeding districts, better results will be obtained in this direction.

12. As it is found that 65 per cent. of mares covered are usually empty, and in view of the fact that dual coverings have been practised since November 1893, I think that the number of coverings demanded at present, viz., 60, should be reduced to 50 hereafter. One consequence of laying down a hard-and-fast-rule that 50 mares should be covered, is that District officers bring mares to the stallion out of season and hence the high percentage of empty mares.

13. Other causes operating against the raising of good stock are—

(*a*) Young stock worked too early.
(*b*) Want of care of in foal mares.
(*c*) Want of care of foal.
(*d*) No attention paid to the selection of brood mares.

Now that Stock Inspectors are permanently posted in the breeding districts, I trust that these conditions may be overcome.

14. I regret that the pony-breeding report for the year under review is unsatisfactory, but notwithstanding, evidence of progress is to be observed, and I am of decided opinion that with care good pony stock can be raised.

15. Mr. Mannas, the Deputy Superintendent employed to supervise the pony-breeding operations under the guidance of this office, has carried out his work satisfactorily.

16. *Castration Operations.*—During the year under report, 116 ponies were castrated at Hosúr against 109 in the previous year, whilst in Coimbatore, there were no castrations owing to the want of a salustri. A salustri has since been appointed to fill up the vacancy caused by the death of Mr. Stevens.

17. Annexed is the statement of charges incurred during 1894-95 on behalf of pony-breeding operations :—

Items.	Coimbatore.	Salem.	At Head-quarters and undistributable.	Total.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Establishment	..	726 14 0	..	726 14 0
Feeding charges	2,005 5 2	1,706 7 3	..	3,711 12 5
Petty constructions and repairs ..	178 9 9	..	..	178 9 9
Rewards for castration	28 0 0	..	..	28 0 0
Purchase of stallions	..	..	1,845 0 0	1,845 0 0
Miscellaneous	..	..	..	..
Total ..	2,211 14 11	2,433 5 3	1,845 0 0	6,490 4 2

B.—Cattle Disease Investigation.

18. *Prevention.*—(1) The theoretical portion of the course of training proposed to be given to the Stock Inspectors to enable them to carry on the duties in regard to the Bacteriological Survey was over long ago; but the practical portion of it by field. demonstration is now delayed owing to the absence of cattle disease in the five districts selected for investigation.

(2) Stock Inspectors were from time to time deputed to investigate outbreaks of epizootics reported from Cuddapah, Bellary, Chingleput, North Arcot, Nellore, Salem, South Arcot and Malabar to enable them to acquire practice in the work of investigation. It was found that in most instances the outbreaks subsided by the time these men reached the spot. Their reports in detail as to the enquiries made were duly forwarded to the Assistant to the Inspector-General, Civil Veterinary Department, for information

A Stock Inspector was also deputed to collect information as to the disease "Iduga" (Distomatoses), reported to have caused a number of deaths among the cattle in and around Colair Lake in the Gódávari district. Enquiries conducted by the Inspector being incomplete, he has been again told off to the district with orders to make further and complete enquiries as regards the nature of the disease, &c., and submit his notes thereon so as to enable the Superintendent to go to the locality when the disease is rife. A report as to the information already collected and submitted by the Inspector has been duly forwarded to the Board and a copy thereof to the Assistant to the Inspector-General for information.

(3) No action was taken as regards the treatment of cattle disease, as Government has given up at present all efforts in that direction, except in enforcing Act II of 1866 at large cattle fairs.

C.—Cattle-Breeding.

19. No cattle-breeding is carried on in this Presidency by Government. Several cattle fairs are annually held in many parts of the Presidency, of which those visited by the Stock Inspectors during the year were the Chitra fair in Madura and Subramonea in South Canara. Cattle Disease Act was enforced in both places, but no prosecutions were conducted.

There are no cattle shows held in the Presidency. In future, endeavours will be made to detail Stock Inspectors to visit all the important cattle fairs held in the Presidency in order to collect information regarding the several breeds, in accordance with the instructions issued by the Assistant to the Inspector-General, and also to carry out Act II of 1866 when enforced.

D.—Veterinary Instruction.

20. Veterinary-Lieutenant Turnbull delivered a course of lectures to the Stock Inspectors on contagious diseases for a space of three months—July, August and September—to fit them for the work of the Bacteriological Survey. Final orders for the opening of a veterinary class in connection with the Agricultural College for training young men for subordinate posts in the Civil Veterinary Department and as private practitioners have not yet been received. I lectured at Saidapet four days a week, from 22nd January to the 28th of March 1895.

21. The strength of the department during the official year was as follows :—

Superintendent	1
Deputy Superintendent	1
Stock Inspectors	13
Clerk	1
Peons	3
Total ...	19

The Deputy Superintendent M.R.Ry. M. Naraina Rao died during May 1894 and Farrier-Major Mannas was appointed in his stead with the designation of Senior Veterinary Assistant. Under the orders of the Government of India this designation was subsequently changed to its old name of Deputy Superintendent, Civil Veterinary Department.

Of the thirteen Stock Inspectors, two, namely, Subramonea Mudaliar and Hassan Ali Saib, were deputed to study in the Bombay Veterinary College and to appear for the Diploma examination after one year's course. They have returned successful, having been placed in the 1st class. It is proposed that one of them should be appointed and styled the Assistant to the Superintendent, Civil Veterinary Department, and his duty will be mainly the supervision of the work of the Stock Inspectors. The other graduate, it is proposed, will be posted in the Agricultural College in connection with the Special Veterinary class which is to be opened on receipt of orders from the Government of India.

The remaining eleven Inspectors worked in the Board's office on clerical duty, though they were frequently sent to the districts for short periods on veterinary work. They are now posted to the five districts proposed to be surveyed with definite instructions as to their future work.

E.—General.

22. (1) The districts visited by my predecessor and myself were Salem, Coimbatore and South Arcot.

(2) During the year two pony shows were held—one at Tiruppúr of the Coimbatore district in May 1894 and another at Mecheri of the Salem district in March 1895. The former was attended by my predecessor and the latter by myself as ex-officio members of the judging committee. Reports thereon were duly submitted to the Board.

(3) Miles travelled by Veterinary-Lieutenant Turnbull—

By road	465
„ rail	2,963
„ boat or steamer	*Nil.*

Miles travelled by me—

By road	193
„ rail	1,373
„ boat or steamer	*Nil.*

The number of days spent by Veterinary-Lieutenant Turnbull on tour out of 200 days he was in charge of the department was 40, and nine out of 122 days by myself.

APPENDIX II.

STATISTICS of mortality reported among cattle in the Madras Presidency during the year 1894–95.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.						Total.		Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	664,0	1,253	1,351	1,083	2,413	60	734	6,894	10	2,327	5	46	202	..	2,580	9,474	14
Vizagapatam ..	151,5	374	175	400	34	75	942	2,000	13	1,635	144	49	95	..	1,923	3,923	26
Gódávari	1,168,8	447	688	2,372	100	75	3,082	6,764	6	8,056	169	204	499	7	8,935	15,699	13
Kistna	967,0	169	549	742	356	35	2,050	3,901	4	9,095	405	196	198	4	9,898	13,799	14
Kurnool	588,7	565	145	989	271	168	4,391	6,529	11	4,185	280	127	552	3	5,147	11,676	20
Bellary	524,1	542	112	321	218	22	1,766	2,981	6	1,132	164	20	229	..	1,545	4,526	9
Anantapur	544,7	428	322	505	220	146	2,927	4,548	8	3,777	135	16	241	3	4,172	8,720	16
Cuddapah	1,022,3	2,419	1,046	1,928	446	343	8,008	14,190	14	5,250	364	81	486	3	6,184	20,374	20
Nellore	598,6	79	95	425	9	55	871	1,534	3	1,693	159	68	46	3	1,969	3,503	6
Chingleput	479,7	278	995	1,157	1,262	73	1,043	4,808	10	16,981	297	481	38	..	17,797	22,605	47
South Arcot	1,192,5	472	293	1,264	298	32	1,494	3,853	3	10,278	258	221	128	..	10,885	14,738	12
North Arcot	1,689,9	595	696	1,437	673	6	164	3,571	2	13,094	218	228	872	..	14,412	17,983	11
Salem	875,9	35	212	214	117	42	1,329	1,949	2	657	95	33	248	4	1,037	2,986	3
Coimbatore	1,105,0	132	250	412	192	71	2,738	3,795	3	1,857	167	116	973	3	3,116	6,911	6
Trichinopoly ..	631,4	170	80	186	83	1	515	1,035	2	3,785	140	76	43	..	4,044	5,079	8
Tanjore	966,9	140	161	681	182	..	350	1,514	2	7,992	150	111	..	1	8,254	9,768	10
Madura	619,6	99	276	680	147	45	1,114	2,361	4	3,910	250	134	322	1	4,617	6,978	11
Tinnevelly	645,1	37	269	295	6	33	312	952	1	7,279	146	158	130	..	7,713	8,665	13
Nilgiris	67,1	11	50	6	130	..	68	265	4	1,853	204	15	458	..	2,530	2,795	42
Malabar	900,8	95	317	37	32	..	781	1,262	1	12,594	299	88	2,409	..	15,390	16,652	18
South Canara ..	708,0	4,783	1,500	124	63	499	542	7,511	11	13,247	1,119	25	2,245	..	16,634	24,145	34
Total ..	161,116	13,123	9,582	15,258	7,252	1,781	35,221	82,217	5·1	130,677	5,168	2,491	10,414	32	148,782	230,999	14·3
In Zemindaris.																	
Vizagapatam ..	Not available.	225	194	389	129	22	455	1,414	..	407	77	27	79	3	593	2,007	..
Nellore		..	1	38	5	3	114	161	..	..	2	1	..	..	3	164	..
North Arcot		626	48	438	159	..	157	1,428	..	4,051	92	78	257	..	4,478	5,906	..
Total ..	..	851	243	865	293	25	726	3,003	..	4,458	171	106	336	3	5,074	8,077	..
Grand Total ..	..	13,974	9,825	16,123	7,545	1,806	35,947	85,220	..	135,135	5,339	2,597	10,750	35	153,856	239,076	..

Monthly statistics.

Months.	Deaths due to diseases.							Deaths due to other causes.						Total deaths from all causes.
	Rinderpest.	Diarrhoea and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1894	877	801	844	308	33	1,992	4,855	8,816	348	123	629	..	9,916	14,771
May „	650	851	890	342	66	2,552	5,351	8,734	378	161	851	5	10,129	15,480
June „	1,043	718	987	341	160	3,443	6,692	10,286	412	172	813	..	11,683	18,375
July „	1,226	709	1,794	579	231	4,184	8,723	12,987	574	222	980	3	14,766	23,489
August „	1,219	826	1,581	842	84	4,103	8,655	12,964	521	266	1,032	3	14,786	23,441
September „	1,540	1,359	2,139	757	220	4,140	10,155	10,710	500	328	1,007	..	12,545	22,700
October „	2,072	1,084	2,170	691	158	3,640	9,815	11,781	580	329	1,123	6	13,819	23,634
November „	1,578	763	2,045	620	133	3,283	8,422	12,041	454	243	996	..	13,734	22,156
December „	1,110	668	1,329	761	186	2,221	6,275	12,429	427	269	1,047	7	14,179	20,454
January 1895	839	597	983	859	185	2,014	5,477	12,102	379	165	912	3	13,561	19,038
February „	758	732	608	765	94	2,061	5,018	11,037	372	171	690	1	12,271	17,289
March „	1,062	717	753	680	256	2,314	5,782	11,248	394	148	670	7	12,467	18,249
Total ..	13,974	9,825	16,123	7,545	1,806	35,947	85,220	135,135	5,339	2,597	10,750	35	153,856	239,076

STATISTICS of mortality reported among sheep and goats in the Madras Presidency during the year 1894–95.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.						Total.		Deaths due to other causes.						Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	1,294	113	155	40	131	..	66	505	4	293	..	1	74	..	368	873	6
Vizagapatam ..	512	70	3	45	4	54	30	206	4	136	55	2	70	..	263	469	9
Gódávari	1,155	2	1	140	24	15	153	335	3	165	27	5	85	..	282	617	5
Kistna	2,744	1	2	20	165	150	186	524	2	483	32	4	210	..	729	1,253	5
Kurnool	5,381	13	18	159	34	624	239	1,087	2	163	21	23	415	..	622	1,709	3
Bellary	5,547	29	156	120	569	1,003	200	2,077	4	276	24	2	112	..	414	2,491	4
Anantapur	8,014	213	639	391	373	8,265	2,611	12,492	16	1,315	584	1	371	..	2,271	14,763	18
Cuddapah	13,561	217	375	138	181	2,267	1,060	4,238	3	865	195	9	828	..	1,897	6,135	5
Nellore	5,712	551	72	319	155	189	563	1,849	3	577	34	3	76	..	690	2,539	4
Chingleput ..	3,197	168	110	341	535	333	528	2,015	6	1,531	296	15	98	..	1,940	3,955	12
South Arcot ..	12,492	103	36	320	336	82	1,193	2,070	2	1,280	144	13	76	..	1,513	3,583	3
North Arcot ..	6,688	438	2	215	35	308	30	1,028	2	1,185	13	7	216	..	1,421	2,449	4
Salem	11,396	51	112	1	..	208	302	674	1	160	15	6	205	..	386	1,060	1
Coimbatore	13,802	77	109	179	23	112	1,217	1,717	1	674	416	20	721	..	1,831	3,548	3
Trichinopoly ..	11,639	52	34	93	20	91	372	662	1	2,260	704	22	162	..	3,148	3,810	3
Tanjore	7,375	..	27	10	4	..	39	80	..	862	51	3	29	..	945	1,025	1
Madura	7,114	45	93	305	90	126	1,719	2,378	3	2,835	111	11	98	..	3,055	5,433	7
Tinnevelly	10,857	59	75	205	9	1,250	1,271	2,869	3	6,065	334	13	545	..	6,957	9,826	9
Nilgiris	75	..	..	..	..	10	..	10	1	24	1	..	4	..	29	39	5
Malabar	650	..	15	3	3	..	24	45	1	249	4	4	106	..	363	408	6
South Canara ..	108	13	..	..	..	..	1	14	1	43	8	..	29	..	80	94	8
Total ..	129,313	2,215	2,034	3,044	2,691	15,087	11,804	36,875	2·8	21,441	3,069	164	4,530	..	29,204	66,079	5·1
In Zemindaris.																	
Vizagapatam ..	Not available.	108	62	113	190	4	31	508	..	177	12	6	176	..	371	879	..
Nellore		..	..	2	..	22	107	131	..	4	..	..	17	..	21	152	.
North Arcot ..		392	..	82	14	200	1	689	..	697	7	5	232	..	941	1,630	..
Total ..	..	500	62	197	204	226	139	1,328	..	878	19	11	425	..	1,333	2,661	..
Grand Total ..	..	2,715	2,096	3,241	2,895	15,313	11,943	38,203	..	22,319	3,088	175	4,955	..	30,537	68,740	..

Monthly statistics.

Months.	Deaths due to diseases.							Deaths due to other causes.						Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1894	249	122	229	65	1,581	783	3,029	1,229	616	8	362	..	2,215	5,244
May ,, ...	146	244	156	324	1,101	502	2,473	1,666	341	14	327	..	2,348	4,821
June ,, ...	114	402	118	39	773	285	1,731	1,320	644	7	363	..	2,334	4,065
July ,, ...	175	75	127	137	714	719	1,947	1,599	459	11	437	..	2,506	4,453
August ,, ...	79	191	185	79	568	1,140	2,242	1,740	179	18	418	..	2,355	4,597
September ,, ...	410	257	206	105	507	1,602	3,087	1,631	63	14	447	..	2,155	5,242
October ,, ...	260	97	819	307	670	1,276	3,429	2,089	252	20	528	..	2,889	6,318
November ,, ...	243	122	221	230	665	1,151	2,632	2,918	115	19	463	..	3,515	6,147
December ,, ...	252	177	210	386	974	969	2,968	2,706	73	14	498	..	3,291	6,259
January 1895	454	156	346	378	2,566	912	4,812	1,856	117	14	416	..	2,403	7,215
February ,, ...	131	116	291	398	2,083	1,420	4,439	1,563	79	16	336	..	1,994	6,433
March ,, ...	202	137	333	447	3,111	1,184	5,414	2,002	150	20	360	..	2,532	7,946
Total ..	2,715	2,096	3,241	2,895	15,313	11,943	38,203	22,319	3,088	175	4,955	..	30,537	68,740

STATISTICS of mortality reported among horses and ponies in the Madras Presidency during the year 1894–95.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.			Total.		Deaths due to other causes.						Total deaths from all causes.	
		Diarrhœa and dysentery.	Anthrax.	All other diseases.	Number.	Rate per mille.	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	Number.	Rate per mille.
Ganjám	1	..	2	1	3	30	..	..	..	..	..	..	3	30
Vizagapatam	2	..	..	..	..	..	2	2	1	1	..	6	6	30
Gódávari	15	..	6	39	45	30	32	3	..	4	..	39	84	56
Kistna	6	..	..	8	8	13	30	2	2	12	..	46	54	90
Kurnool	31	1	1	26	28	9	32	5	8	47	..	92	120	39
Bellary	37	..	..	14	14	4	9	1	1	21	..	32	46	12
Anantapur	28	..	..	17	17	6	20	2	..	22	..	44	61	22
Cuddapah	21	1	1	9	11	5	6	..	..	19	..	25	36	17
Nellore	7	..	..	5	5	7	..	..	..	..	..	..	5	7
Chingleput	8	2	..	10	12	15	39	2	..	..	..	41	53	66
South Arcot	31	..	..	6	6	2	16	2	..	2	..	20	26	8
North Arcot	4	..	..	2	2	5	7	1	1	1	..	10	12	30
Salem	54	..	..	3	3	1	2	..	2	1	..	5	8	1
Coimbatore	49	..	..	5	5	1	5	1	..	17	..	23	28	6
Trichinopoly	8	..	..	..	..	..	5	1	..	..	..	6	6	7
Tanjore	15	..	..	2	2	1	15	2	..	..	..	17	19	13
Madura	17	..	2	7	9	5	29	3	1	36	..	69	78	46
Tinnevelly	6	..	..	..	..	..	10	..	..	1	..	11	11	18
Nilgiris	14	..	..	..	..	..	26	2	..	19	..	47	47	34
Malabar	9	..	1	..	1	1	8	..	..	..	..	8	9	10
South Canara	2	..	..	..	..	..	10	1	..	1	..	12	12	60
Total ..	365	4	13	154	171	4·7	303	30	16	204	..	553	724	19·8
In Zemindaris.														
Vizagapatam	Not available.	..	..	1	1	..	..	..	..	..	..	..	1	..
Nellore		..	..	..	..	..	..	..	..	..	..	..	..	..
North Arcot		..	..	..	..	..	4	..	..	..	..	4	4	..
Total ..	..	..	..	1	1	..	4	..	..	..	..	4	5	..
Grand Total ..	..	4	13	155	172	..	307	30	16	204	..	557	729	..

MONTHLY statistics.

Months.	Number of deaths due to diseases.				Deaths due to other causes.						Total deaths from all causes.
	Diarrhœa and dysentery.	Anthrax.	All other diseases.	Total	Natural decay.	Accident.	Snake-bite.	Wild animals.	Criminal poisoning.	Total.	
April 1894	..	1	3	4	19	2	..	17	..	38	42
May ,, ...	1	..	11	12	20	1	..	24	..	45	57
June ,, ...	..	3	12	15	13	2	6	11	..	32	47
July ,, ...	1	..	21	22	27	3	1	36	..	67	89
August ,, ...	..	1	14	15	28	3	3	20	..	54	69
September ,, ...	..	2	18	20	26	2	1	13	..	42	62
October ,, ...	..	1	26	27	30	6	3	7	..	46	73
November ,, ...	..	2	14	16	34	..	1	11	..	46	62
December ,, .. .	1	..	17	18	34	4	1	17	..	56	74
January 1895	..	..	9	9	34	5	..	19	..	58	67
February ,, ...	..	1	1	2	27	1	..	14	..	42	44
March ,, ...	1	2	9	12	15	1	..	15	..	31	43
Total ..	4	13	155	172	307	30	16	204	..	557	729

Order—No. 662, Revenue, dated 4th October 1895.

Miscellaneous.

With its Proceedings read above, the Board of Revenue submits its report on the administration of the Department of Land Records and Agriculture during the year 1894-95.

2. In paragraph 1 of the report, the Acting Director points out the desirability of introducing several changes in the subject-matter of the report by the omission of information on matters which are fully dealt with in other reports. The Government, while agreeing generally in the views now expressed by the Acting Director, considers that any detailed discussion of the subject should be held over pending the receipt of the communication promised by the Government of India in their letter No. 2376—42, dated 30th August 1893,* regarding the suggestions of the Agricultural Conference held at Simla in October 1893 and in view of the approaching visit of Sir Edward Buck. Until a new form is decided on by the Supreme Government, no alteration can be made in the one prescribed in Circulars No. 54A,† dated 28th April 1884, and No. 52-G.—69-6,† dated 14th September 1887. At the same time the Government is unable to see what useful purpose is served by reprinting, as an appendix to the present report, the report of the Superintendent, Civil Veterinary Department, already submitted and reviewed in G.O., No. 595, dated 2rd September 1895.

* G.O., Mis. No. 3464, dated 20th September 1893.

† G.O. No. 681, dated 28th May 1884.
„ No. 1094, dated 21st November 1887.

3. *Land Records.*—The chief event in the administration of this branch of the department during the year was the completion of the training in survey work of karnams (village accountants) and Revenue Inspectors with a view to fit them for the duties of correcting and maintaining village maps and survey records. A special controlling staff to supervise the work of these subordinate Revenue and Village officers was also sanctioned soon after the close of the year. It is hoped that these arrangements will render unnecessary any re-surveys in future.

4. Some progress was made during the year in the preparation of village registers and firka books, but the Government agrees with the Board in considering that the delay in certain districts should have been avoided. As regards the discontinuance of the reports on the economic conditions of districts, referred to in paragraph 11, the Government considers that the question should be separately submitted for its orders as required by rule 7 of the rules circulated with G.O., Mis. No. 7772, dated 22nd December 1886.‡

‡ On G.O., No. 2596, Public, dated 13th December 1886.

5. *Agriculture.*—The Government notes with satisfaction that some important experiments connected with agriculture were carried on during the year. It appears, however, from paragraph 26 of the Board's Proceedings that the crop-experiments carried out by Revenue officers were of little or no value, owing to neglect or disregard of the instructions issued. The Government fails to understand why "many of the experiments necessarily extend over several days." It is of course essential that each experiment should be begun and finished while the officer making it is on the spot and observing carefully what is going on. There should be no difficulty whatever in the matter. All that is required is that the plot chosen for experiment should be of such a size as to admit of the crop being cut, threshed out and measured within the time at the officer's disposal. In May last the Government of India informed this Government that their orders regarding agricultural experiment and education, pending the receipt of which the opening of farms and farm schools in this Presidency is delayed, would be communicated in the autumn of this year. It has since been decided by the Supreme Government to depute Sir Edward Buck to the different Provinces in order to discuss with the local authorities the feasibility of adopting several of the suggestions made by the Agricultural Conference held at Simla in October 1893. As the subject of agricultural education and experiment will be one of the subjects, the details of which will require special discussion, the establishment of the farms and farm schools will probably have to be postponed for another year.

6. The submission of the report called for in G.O., No. 2226, dated 5th June 1895, regarding the employment of a Dairy expert should be expedited.

7. *Veterinary Department.*—The report on the work of this department, so far as it relates to mule and pony-breeding, has already been reviewed in G.O., No. 595, dated 2nd September 1895.

The mortality from diseases of horned cattle and of horses and ponies exhibited a satisfactory decrease as compared with the previous year, while that of sheep and goats showed an increase. The number of deaths from unspecified diseases was very large in Cuddapah, Kurnool and Bellary and the Government agrees with the Board in considering that it is a matter for investigation by the Superintendent, Civil Veterinary Department.

8. On further consideration Government is disposed to agree with the Board that the statistics of cattle mortality from "natural decay" are so incomplete as to be utterly useless. The desirability of recording such deaths is moreover not the same as exists in the case of deaths due to disease; and it is in fact impossible for village officers with their other heavy duties to perform the task properly. The registry of mortality among live-stock from "natural decay" may therefore be abandoned.

9. The other points noticed in the report do not call for any special remarks.

10. It is observed that the report called for in paragraph 8 of G.O., No. 755, Revenue, dated 20th August 1891, regarding the results of the appointment of a Deputy Director of the Department of Land Records should have been received on the 1st instant. Its submission should be expedited.

(True Extract.)

(Signed) E. GIBSON,
Secretary to Government.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1895-96.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1897.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1895-96.

REPORT OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE FOR THE YEAR 1895-96.

Introductory.—With a view to arriving at conclusions as to the best manner of utilizing Land Records for obtaining information and giving effect to the recommendations made in Dr. Voelcker's report, Sir Edward Buck was deputed by the Government of India during the year to discuss, with such officers as the Local Government might appoint, the proposals of the Simla Conference of 1893, and to submit definite proposals for the consideration of the Local Governments. With this end in view, two committees were appointed; one, consisting of the Director of this Department, the Director of Public Instruction, Mr. F. A. Nicholson, the Deputy Director of Land Records and Agriculture and the Acting Principal of the College of Agriculture, to discuss the various proposals of the Local Government for carrying on Agricultural Education and Experiment; and the other, consisting of the Director and the Hon'ble Mr. Sturrock, Commissioner of Land Revenue, to discuss with Sir Edward Buck the other suggestions made by the conference alluded to. The recommendations made by these committees, which sat in December 1895, were as follow :—

(1) That Agriculture should not appear as a separate subject in the curriculum of rural Primary schools, but that the effort should be to impart an elementary knowledge of it in the group " Object Lessons and Elementary Science," which group should be made a *compulsory* subject ;

(2) that Agriculture should be recognized as a separate optional subject for boys after they have passed the Fourth Standard, and that, until properly qualified teachers become available, the study of a text-book on Agriculture in Lower Secondary schools will be better than nothing ;

(3) that the first necessary step is to provide for the training of the teachers of Lower Secondary and Primary rural schools, and that to this end every training institution, where such teachers are trained, should—

(*a*) have on its staff a master qualified to teach Agriculture, and
(*b*) have attached to it a school-garden ;

(4) that to secure an adequate supply of trained teachers for the rural Primary and Lower Secondary schools, an Agricultural class should be developed in selected educational institutions where the general education will be carried on up to the Upper Secondary Examination and special education in Agriculture up to the Intermediate Standard. Such classes will need a small demonstrational farm for teaching purposes, and a portion of a Government Experimental farm may be utilized for the purpose, if there be one in the vicinity ;

(5) that it is not otherwise expedient to combine a Farm-school for the above purpose, with an Experimental farm, as proposed in the scheme of the Madras Government;

(6) that the early establishment of Experimental farms, as separate organizations, and designed for carrying on agricultural investigation, is advisable ;

(7) that in Madras adequate provision has been made for the timely reporting of sudden calamities ;

(8) that as regards any serious gradual deterioration, or decline, in a village or tract, the annual ryotwari settlement ensures its being brought to the notice of the Jamabandi officer ;

(9) that a vigilant and intelligent scrutiny of the village registers by the Jamabandi officer, with a view to discovering the cause of any remarkable fluctuations, should continue to be insisted on ;

(10) that, to provide an account whereby the decline, or progress, of a village can be seen at a glance, it is desirable to compress into one page the more important of the voluminous statistics now embodied in the Revenue Inspector's firka book ; and that if this is done the firka book, in its present shape, may be dispensed with ;

(11) that it answers no useful purpose to require of Collectors an annual report on the economic condition of their districts as disclosed by a scrutiny of the Land Records, and that in the absence of extraordinary change, such a report cannot be usefully submitted oftener than once in ten years ;

(12) that the statistical atlas, now in course of publication, will exhibit a sufficient analysis of each district, in respect of the great agricultural defect, " deficiency of rainfall and absence of irrigation " ;

(13) that defects in irrigation and in the supply of wood and fuel are being adequately investigated by the Revenue, Public Works and Forest Departments ;

(14) that a list of the other principal agricultural defects should be drawn up, and that these should be gradually investigated in the order of their importance ;

(15) that Experimental farms are necessary for the ascertainment by agricultural experts of how far defects in agricultural practice are remediable ; and that, in Madras, action in this direction is more pressing than in the direction of improving Land Records ;

(16) that in view of the extreme importance of securing continuity of expert supervision, in the event of Experimental farms being started, immediate steps should be taken to secure the services of a second agricultural expert, to provide for the contingency of Mr. Benson taking furlough, or retiring ;

(17) that if, and when, Mr. Benson leaves the service, the original plan of appointing a Civilian Deputy Director of Land Records may be revived ;

(18) that meanwhile, as Mr. Benson has now devoted a year to the study of village and taluk accounts, it is best to leave him in charge of the office of Deputy Director of Land Records, without prejudice to his supervising any agricultural work which may be undertaken ;

(19) that with reference to the scheme laid before the Government of India for a permanent staff for the maintenance of survey records, and training of karnams (*vide* G.O., No. 635, Revenue, dated 17th September 1895), it should be considered whether the strength of the establishment may not be gradually increased, as vacancies occur in the posts allotted to eight European officers, by replacing them, at the same cost, by twelve native Deputy Collectors. One superior officer would then be available for every two districts, and with this increase in numbers, it would be possible for them to assist in the supervision of the taluk and village accounts ;

(20) that meanwhile, the Board's proposal for the appointment of three officers of the grade of Deputy Collector to assist in inspecting taluk and village accounts (*vide* B. P., dated 1st November 1895, No. 348 (Sett.), may be approved ;

(21) that after the Deputy Director, or one of the proposed Assistant Directors, has inspected the Land Records of a district, he should submit his report, not to the Board as hitherto, but to the Collector of the district—the Board to be referred to only when a specific general ruling is called for ;

(22) that the Collector should devote a paragraph in his jamabandi report to stating the results of the inspection and the action taken by him thereupon.

2. To these recommendations, which are still before Government, the Board appended certain further suggestions for the working of Land Record Branch of the

department, having in view the fact that the work of the Settlement Department will shortly be greatly reduced.

3. At these conferences the form which the annual reports of the department should take was also discussed, but the matter was allowed to stand over, pending the receipt of a communication on the subject from the Government of India, and the form herein adopted is the same as that followed in previous years.

I.—ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

4. *Land Records.*—During April and May the work of the Deputy Director, Mr. Benson, in connection with Land Records was chiefly of a miscellaneous nature, as he remained at head-quarters after his return from tour at the end of the previous month. Towards the latter part of May, however, he proceeded to the Coimbatore district and inspected and reported on the taluk and village accounts of three taluks. Early in July Tirupáttur taluk, in Salem, was visited for the purpose of studying the method followed there in keeping the village and taluk cash accounts with a view to the general revision of the same which is pending. The rest of July and part of August were spent in inspection in Chingleput district, as the Deputy Director had to remain near Madras, having been appointed to serve on a committee formed for testing certain water-lifts. After the inspection of the above-mentioned district, he submitted a report on the work done since the institution of the office, and also formulated certain proposals as to its future conduct which are still before Government. The period for which the appointment was sanctioned terminates in November next, and the proposals for the future have already been noted above.

5. The inspection of the accounts in the three taluks of Cuddapah engaged the Deputy Director during September, and with this he completed the inspection of all the recently settled districts. With the exception of a brief halt at head-quarters during part of October, the Deputy Director spent the following months in visiting the Kistna, Bellary, Anantapur, Madura, Tinnevelly and Tanjore districts, to confer with the District Officers on certain suggestions which he proposed to submit in connection with the revision of the village and taluk accounts. In December he returned to head-quarters to attend the conferences on Agricultural and Land Record matters with Sir Edward Buck, and at the end of the month proceeded to Poona and Belgaum, to acquaint himself with the Bombay system of working the village cash accounts. After his return, he again proceeded to Kistna on an ordinary tour of inspection and inspected the village and taluk accounts in four taluks; the Board having decided that he should inspect all the remaining districts of the Presidency since the maintenance of the survey records had been transferred to a special establishment. He returned early in March and remained at head-quarters during the rest of the year engaged on the work of revising the manual of village accounts.

6. The reports submitted by the Deputy Director regarding the results of his examination of the village and taluk accounts in the several districts referred to above were reviewed in detail and the necessary instructions issued to the Collectors concerned to rectify the defects pointed out. The reports showed generally that the village accounts were fairly well maintained, though they contained many minor errors and omissions; but that the taluk accounts received insufficient attention at the hands of Tahsildars and Taluk Head Accountants, and that far closer supervision from Divisional Officers was required than had been exercised.

7. Reference has already been made to the Deputy Director being engaged on the revision of village and taluk accounts. During the year under report, he submitted proposals for revising village accounts Nos. I and II. His proposals involved a slight change of the present forms for the latter, but considerable alterations in the manner of working it, as well as the abolition of No. I account. These proposals were therefore referred to Collectors for opinion. Since the close of the year proposals for revising most of the other forms of village accounts have also been submitted by the Deputy Director.

8. The question of simplifying the forms of the annual returns of agricultural statistics prescribed by the Government of India was also considered during the year and a joint memorandum drawn up by the Deputy Director and the Secretaries to the

Board in the Land Revenue and Settlement Departments was submitted to Government, which has expressed its concurrence with the suggestions made, and has addressed the Government of India with a view to their adoption.

9. *Training of Karnams.*—A scheme for holding annual survey schools in each taluk of the Presidency was sanctioned by Government during the year. Schools were accordingly held in 145 out of the 156 taluks of the Presidency, and 13,647 men (including probationers) were instructed. The remaining 11 taluks, which are situated in the Trichinopoly, Salem and Nellore districts, are shown in the margin. Schools could not be held in the Trichinopoly district as the karnams who had been instructed in survey in faslis 1302 and 1303 were engaged on work connected with the revision of settlement and with the jamabandi of fasli 1304, and had also to do other pressing work connected with the re-survey and re-settlement towards the close of the year. In the five taluks of Salem it was thought unnecessary to hold any survey schools, as the karnams were actually engaged on the work of re-survey, while in the Ongole taluk of the Nellore district, the Head Surveyor fell ill, and no substitute could be sent to take his place before the jamabandi of fasli 1305 was commenced.

District.	Taluks.
Trichinopoly ...	Trichinopoly.
	Kulittalai.
	Musiri
	Udaiyárpálaiyam.
	Perambalúr.
Salem ...	Uttangarai.
	Salem
	Tiruchengódu.
	Námakkal.
	Atur.
Nellore ...	Ongole.

10. *Training of Revenue Inspectors.*—Out of the 626 Revenue Inspectors in the Presidency, including those in the Madras district, 592 men, permanent and acting, are reported to have undergone training in survey; while the remaining 34 men are untrained. Two of them are men exempted from passing the test and two more are old men retained on the old scale of pay. Two of the remaining 30 posts were vacant at the end of the year, while the rest were held by acting men untrained in survey.

11. In accordance with the orders of Government sanctioning a scheme for the maintenance of boundary marks and survey records, the Presidency was divided into six divisions each containing from 3 to 4 districts and from 23 to 29 taluks. At the beginning of the year, a Surveyor was sent to each district to work under the orders of the Collector, and as soon afterwards as could be arranged, a Survey Officer took charge of each division. The duties of the Survey Divisional Officers are—

1*st*, to see that all missing boundary marks are replaced;
2*nd*, to see that all changes in occupation are shown in the survey records;
3*rd*, to supervise the survey schools for karnams held every year in each taluk;
4*th*, to supervise any special surveys or re-surveys which may be ordered in their respective divisions.

12. *Re-surveys.*—The re-surveys which were in progress theat beginning of 1895–96 in the Gódávari, Kistna and Salem districts were completed; the total area resurveyed during the year being 1,692 square miles. The work has since the close of the year been undertaken in the two taluks of Guntúr and Nandigáma, not included in the original forecast and in the Kurnool district. The completed maps and records of more than half the number of villages have been received in the Central Office and those for the rest of the villages are expected to be completed during the current recess —June to September 1896.

II.—ANALYSIS OF DISTRICTS.

13. *Statistical Registers.*—The village statistical registers and the firka books have been written up and checked in all the districts except North Arcot and Madura up to fasli 1303. In 173 villages of Pólúr taluk in the former district, these are reported to have been prepared in the old form and checked. The Collector explains that he has issued instructions to the Tahsildar to have them prepared in the new form for these villages and also to bring them up to the latest fasli. In Madura, the registers of 270 villages remained to be prepared, and those of 475 to be checked, but, except for five inam villages in the Dindigul taluk, no registers for such villages have been prepared. From the information obtained as regards the work done in this direction during fasli 1304 (1894–95), it would appear that the posting and checking have been completed

in the Ganjám, Vizagapatam, Cuddapah, Bellary and Anantapur districts, and is approaching completion in Gódávari, Nellore, Kurnool, South Arcot, Salem, Tanjore, Nilgiris and Trichinopoly. Particulars of progress are given in the table below :—

Districts.	Number of villages (Government and Inam).				
	In the district.	For which village registers have been		For which firka books have been	
		Prepared.	Checked.	Prepared.	Checked.
Ganjám	1,531	Complete.			
Vizagapatam	294				
Gódávari	1,476	1,392	1,392	1,392	1,392
Kistna	1,368	1,357	1,337	1,164	1,147
Nellore	931	921	913	925	928
Kurnool	786	Complete.		706	654
Bellary	962	Complete.			
Anantapur	1,002				
Cuddapah	1,354				
Chingleput	1,782	1,630	1,628	1,627	1,627
North Arcot	1,669	1,496	1,496	1,496	1,496
South Arcot	2,700	2,645	2,584	2,547	1,960
Salem	3,081	3,056	3,056	3,056	3,056
Coimbatore	1,508	Complete.		1,469	1,469
Nilgiris	48	47	29	42	17
Tanjore	2,540	Complete.		2,525	2,525
Trichinopoly	730	705	705	705	705
Madura	937	705	397	563	114
Tinnevelly	1,099	1,043	879	901	752

This matter will be further referred to in the Board's jamabandi report.

14. Reports on the economic condition of the districts, as disclosed by an examination of the village registers and the firka books, were received during the year from the districts noted in the margin, and submitted to Government with brief reviews thereon. During November 1895, the Board issued orders to such of the Collectors as had submitted one or more reports on the economic condition of their districts, suspending the submission of the same in view of the approaching visit of Sir Edward Buck to consult with Provincial Officers as to framing a practical scheme for carrying out the district analysis desired by the Government of India, and at that conference it was agreed that such annual reports were unnecessary. The reports since received from Gódávari and Tanjore districts have been simply recorded by the Board with reference to the above.

Anantapur.
South Arcot.
Ganjám.
Chingleput.
Bellary.
Kistna.
Coimbatore.
Tinnevelly.
Kurnool.
Madura
Nellore.

15. The Statistical Atlas has been published and is being issued. It was pronounced by Sir Edward Buck to suffice as an analysis of districts in reference to the chief agricultural defects—deficiency of rainfall and absence of irrigation. It is proposed that this atlas should be revised as soon as a new census is taken and brought up to date. This can easily be done by the District Officers, who will also be able to correct errors and omissions in the present issue.

III.—COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

16. There was generally no difficulty in the collection of revenue due to Government. Owing to the damage caused by floods, however, the collection of revenue had to be suspended in some of the villages of the Gudiváda taluk in the Kistna district and in the Srívaikuntam, Nángunéri and Tinnevelly taluks in the Tinnevelly district. Suspension of collections had also to be ordered in a few villages of the Gudiyáttam taluk of the North Arcot district, on account of the unfavourable character of the season.

With regard to the Board's recommendation for a revision of the kistbandi, or instalments for the payment of revenue, referred to in paragraph 13 of the report for the previous year, the Government decided after the close of the year that no case had been made out for any change in the existing kistbandi except in the district of Tanjore, where it directed that the existing complicated kistbandi of eight instalments should be assimilated to that of four equal instalments obtaining in other districts,

beginning from January as in the neighbouring district of South Arcot. Instructions have been issued to the Collector of Tanjore to notify the change at once as widely as possible and to intimate to the ryots that the new kistbandi will be brought into force from fasli 1306 (1896–97).

IV.—MEASURES OF PROTECTION.

17. *Extensions of Communications.*—The East Coast Railway has been opened for public traffic as far as Kurdu Road, a total length of 491 miles from Bezwada. Work on the Nilgiri Railway (81 miles *) has been resumed and is making fair progress. The Madras-Ennore Railway (8·55 miles) was opened on the 22nd February 1896. The Ennore-Bezwada section (254½ miles) of the East Coast Railway has been sanctioned and work is making good progress. A survey has been made for a railway from Arcot Railway station to Arcot town (6 miles).

18. *Irrigation.*—Good progress was made on the Rushikulya works in the Ganjám district and on the Periyár project in the Madura district, the expenditure incurred on them being Rs. 2·26 lakhs and Rs. 5·59 lakhs, respectively, which raises the total capital outlay on those projects up to end of 1895–96 to over Rs. 39·07 lakhs and Rs. 79·15 lakhs, respectively. The Russellkonda reservoir together with its feeder, the Gulleri channel, and the incomplete works of the Rushikulya canal and most of its distributaries were completed. The Periyár main dam and 108 miles of main and branch channels in the Madura district were completed. The Periyár works were formally opened on the 10th October 1895 by His Excellency the Governor of Madras. On improvements to the Kistna Delta system Rs. 5·43 lakhs were spent during the year; raising the total capital expenditure to Rs. 113·77 lakhs.

The Minor Irrigation Works under the charge of the Revenue Department number over 30,000, having an irrigable area of about 1½ million acres. The amount sanctioned for their repairs during the year was Rs. 4·22 lakhs, out of which Rs. 3·97 lakhs were actually expended.

19. *Advances to Agriculturists.*—The loans granted during the year under report, under the Land Improvement and Agriculturists' Loans Acts, amounted to Rs. 2,03,472 against Rs. 2,79,591 advanced in 1894–95 and Rs. 4,50,921 advanced in 1893–94. The great falling off in the demand for State loans, as compared with the preceding years, is due, as explained in the report for the previous year, to the improvement in the season that has taken place since the close of the distress in 1892. Nearly 75 per cent. of the total advances were made in Coimbatore, Tinnevelly, North Arcot and South Arcot. The following table shows the amounts advanced under the two Loans Acts during each of the past five years:—

Years.	Budget allotment under both Acts.	Advances made under		Total advances.
		The Land Improvement Loans Act.	The Agriculturists' Loans Act.	
	Rs.	Rs.	Rs.	Rs.
1891–92	13,39,000	15,28,407	1,57,258	16,85,665
1892–93	23,00,000	20,41,809	2,33,350	22,75,159
1893–94	10,00,000	† 4,40,312	† 10,609	4,50,921
1894–95	7,00,000	2,63,709	15,882	2,79,591
1895–96	3,00,000	1,91,521	11,951	2,03,472

V.—AGRICULTURAL EXPERIMENTS.

20. *Agricultural Education.*—The concession allowed by Government to the holders of Agricultural diplomas by permitting them to appear for the Criminal and Revenue Higher Examinations, and thus placing them on a level with graduates, did not produce any appreciable effect in increasing the strength of the College during the year: on the other hand, there appeared a slight decrease below that of the previous year, which was explained by the Principal as due to the fact that Sudra students do not find comfortable homes at Saidapet. Much weight should not be attached to the above explanation; but, as the matter is one of importance, and as it is most desirable to attract Sudra students to study at the College, the Collector of Chingleput has been

* An error for 16·81.

† The increase over the figures entered in the report for 1893–94 is due to adjustments made by the Accountant-General.

requested to report on the facilities available for such students to live at Saidapet. A committee was appointed during the year to revise the syllabuses in "Surveying and Levelling" and in "Agricultural Engineering," and submitted revised ones which were brought to force during the year under report. The syllabus in "Organic Chemistry" also appears to have been revised in consultation with Dr. Leather, and a new one introduced during the same period. Though the results under the revised syllabuses were not favourably viewed by the Principal, yet it appears far too early as yet to form any opinion on the results of the change, especially as the examinations were only held during April last and have not been reported on.

The Assistant Agricultural Chemist delivered a course of 21 lectures at the College during November and December. Some of these lectures were devoted to instructing the students in analytical processes, the others were occupied in going over portions of Agricultural Chemistry. He also held an examination. He has been desired by Government to submit a brief report on his work in the College in future.

21. On a suggestion made by the Director of Public Instruction that the Board of Revenue and District Officers should co-operate with the Educational Department in filling subordinate posts in the Revenue Settlement and Forest Departments with men holding Agricultural diplomas, Collectors were requested to give their favourable consideration to applications for appointments from persons holding such diplomas, and the Principal was also asked to forward to District Officers, every year, a statement showing the general and special qualifications of students who have completed their college course, and are willing to take up appointments in the departments concerned.

22. The College farm continued to be worked during the year chiefly in the interests of the students, and as a dairy farm. The report shows that the management was successful, but it is desired to make the report of more general value and to issue the results obtained in a form of more general use.

23. It was proposed by Government to continue the dairy experiments conducted at Saidapet during 1892, but the Principal was of opinion that it was unnecessary to repeat the purely statistical portion thereof, and as the Farm bailiff, who was ordered to proceed to Poona to learn the use of the modern dairying appliances, did not do so till late in the year, and as there was difficulty in getting a sufficient quantity of milk for experiments, they had to be given up. However, Mr. Collins made certain experiments—

(1) as to the relative merits (from a chemical aspect) of butter from farm cows and local buffaloes made by the native process and that made from cream extracted by a "separator;"

(2) as to the best method of separating buffalo's milk by the "Baby Separator." The analyses made showed that the amount of butter fat in the milk of the cows kept on the College farm averaged 4·68 and 3·93 per cent. for the morning and evening milk, respectively, as against 7·31 and 4·82 per cent. for the buffalo's milk. The percentage of butter fat found in the *separated* milk was as noted on the margin. In separating the cream, the "Baby Separator" was found to act exceedingly well even with buffalo's milk, the separation, as in the case of cow's milk, being, to all intents and purposes, complete. The butter from "separated" cream made with a native churn was found to contain ·24 per cent. curd in the case of that made from cow's milk and ·23 per cent. in the case of that made from buffalo's; the amount of water left being, however, large, viz., 21·65 per cent. in the former and 19·66 per cent. in the latter case, the butter not having been sufficiently "worked." Mr. Collins also made some interesting analyses of ground-nut and gingelly-oil cakes, showing that, at present prices, the latter is the cheaper cattle food to use at Saidapet.

	Cows.	Buffaloes.
Morning yield	·13	·12
Evening „	·13	·17

24. The Government proposed during the year that the College-farm herd should be increased so as to supply milk and butter to the hospitals and troops in Madras; but, after considerable enquiry, it was found necessary to abandon the idea as impracticable for financial reasons connected with the initial cost of purchasing a herd of about 400 cows, and the difficulty of providing grazing facilities and sheds for about 200 cows in milk and a run for dry cows and heifers; having in view also the difficulty of providing against any sudden interruption in supply of milk in consequence of

an outbreak of disease in the herd. To overcome the difficulties referred to above, it is now being considered whether the supply of milk and butter cannot be restricted to a limited number of hospitals and the matter is still under consideration.

25. *School Farms.*—No definite orders regarding the starting of these institutions have yet been issued, but the committee which conferred with Sir E. Buck in December last was of opinion that there should be no further delay in starting a suitable number of Experimental farms which it considered to be essential to the investigation of agricultural defects and for progress towards agricultural improvements. The committee also expressed the opinion that it was not expedient to combine Experimental farms with Farm schools save under exceptional conditions. The committee also recommended the attaching of instruction farms to all normal schools where teachers for rural schools are trained, and to a certain number of special schools. These proposals are under consideration.

26. *Agricultural Enquiry.*—With a view to collecting detailed information regarding the different varieties of, and the methods of growing, cholum, cotton and indigo, the Sub-Assistant Director was deputed during the year to make full enquiry regarding these crops in the Ceded Districts, Kurnool and Kistna, three Agricultural Inspectors being deputed to work under him during the cultivating season. The enquiry has been made fairly complete, and reports embracing the information collected are in preparation for publication in the form of bulletins. Collections of specimens of the different varieties of cholum (*Sorghum*) grains have been made and sent to the Reporter on Economic Products for specific identification. During the current year, the enquiry is being extended into the chief Tamil cholum-growing districts.

27. *Experimental Cultivation.*—Owing to the want of timely rain in the months of March and April of the year under report, the barley crop was a failure throughout the Nilgiri plateau, and consequently the usual show had to be abandoned for want of exhibits.

An experiment in the cultivation of Cape oats was conducted on the Nilgiris, but was reported to have failed in so far as the ears did not fill. The straw was, however, excellent.

No reports regarding the results of the further experiments with the new varieties of potatoes alluded to in the report for 1893–94 have been received from Nilgiris.

The reports of the Collectors of Nilgiris and Salem on the experimental cultivation of Seoni pissi wheat referred to in the previous year's report were received during the year. In the former district, the experiment was a failure, partly owing to the weevilled condition of the seed, and partly to the want of timely rain and attention on the part of the cultivators. In Salem, however, the results were, on the whole, reported to be satisfactory considering the unfavourable character of the season. Some of the wheat was also sown in a village of the Madura division, where the crop is reported to have grown to the height of a span and then withered owing to the north wind. The Collectors of Madura and Nilgiris applied for a fresh supply of wheat and steps will be taken to supply them.

At the instance of the Reporter on Economic Products some experiments were conducted on the College farm, Saidapet, in the cultivation of three indigenous fibrous plants called *Sida carpinifolia*, *Sida rhombifolia* and *Triumfetta rhomboidea*. The produce was pronounced to be most unsatisfactory by the Principal, and he also expressed the opinion that it would be unnecessary to try to cultivate a common weed in the hopes of its being able to compete with well-established fibre crops. The report was forwarded to the Reporter who has since pointed out reasons for reconsidering this opinion.

28. *Bulletins.*—Only one bulletin, No. 32, embodying the results of experiments with water-lifts, was issued during the year. The vernacular translations of the bulletin No. 31, alluded to in the previous report, have been printed in the form of leaflets and sent to the District Officers for distribution among the chief ryots of their districts.

29. During the year under report, the Agricultural Chemist to the Government of India made certain suggestions regarding the desirability of systematizing the manner of publishing results obtained on Government Experimental Farms in India. The opinions of the Deputy Director, Land Records and Agriculture, and of

the Principal of the College of Agriculture were obtained thereon, but no action can be taken in this Presidency as no Experimental farms exist, and the Saidapet Farm is almost entirely utilized for educational purposes. In this connection, however, the Principal urged the necessity for revising the "Records of the Saidapet Farm" issued several years ago, containing a *resumé* of the various experiments conducted on the farm at Saidapet. The suggestion of the Principal was accepted by Government and the task of revision has been entrusted to Mr. Keess.

30. *Crop Experiments.*—Reports on the experiments made in fasli 1304 by the Divisional Officers and Tahsildars, with a view to ascertain the outturn of important crops grown in the Presidency, were duly received. These reports were reviewed this year by the Collectors of districts and also by the Deputy Director. These reviews show that the manner of conducting these experiments has not, in a great many of the cases, reached a stage where the results can be safely accepted; but on comparison with the experiments made in the previous year, it is clear that the experimenting officers are surmounting the difficulties which beset them in the earlier years. As remarked in the annual report for the previous year, it may be expected that the next set of experiments will show a considerable improvement.

31. *Agricultural Implements and Machines.*—During the year the Sub-Assistant Director held certain ploughing demonstrations in Kurnool district with specimens of the ploughs which have found so much favour in the adjoining district of Bellary. The ryots who attended them were satisfied with the superiority of the Swedish ploughs, and the only difficulty, which is reported to prevent them from purchasing these ploughs, appears to be that of getting them repaired when out of order. This difficulty is to a great extent already being got over in Bellary where the use of heavy iron ploughs increases annually. A bulletin has recently been published on this subject.

32. *Water-lifts.*—The trials made by the committee alluded to in paragraph 27 of the report for the previous year were carried out during August 1895, but Messrs. Sultan and Co. refrained from submitting their lift for trial on the ground that it was still being improved. The committee, therefore, proceeded with the trial of Messrs. Stoney and Subba Rao's water-lifts. The opinion of the committee on these water-lifts as follows:—

"Regarding both the above lifts, the committee is of opinion that, whilst they are much more efficient than the single mhote, and whilst they, in common with the double mhote, cause much less wear and tear on the bullocks employed, it would require more skill to erect and keep them in working order than is usually available in up-country villages, and that, to enable the village blacksmiths to do this work, their training would have to be improved. As to the cost of the lifts, it is not possible to give any definite information; but the committee consider that either might be put up for about Rs. 150, though the charges for Subba Rao's lift would vary greatly according to the materials locally available."

Regarding M.R.Ry. Subba Rao's new lift, the committee said:—

"As regards M.R.Ry. Subba Rao's new lift, wherein the action is the same as in the single mhote, except that the weight of the bucket is counterbalanced, and the bullocks are enabled to reverse at the end of the incline and walk up the slope, the committee is of opinion that, where cattle labour is scarce, the contrivance should prove most valuable, being well within the means of the ryot, and within the capacity of the village artisans to erect. The committee considers that M.R.Ry. Subba Rao is deserving of great commendation for the ingenuity and perseverance displayed in his efforts to devise an improved water-lift, and deems it a matter for regret that he is under the disadvantage of not having been trained as a mechanical engineer."

Certain suggestions as below were also made by it:—

"In conclusion, the committee begs to report that, since the issue of the orders under which it has acted, a considerable amount of public interest has been evinced in the subject of water-lifts generally, and enquiries have been received from diverse persons anxious that their inventions should be tested. The committee would suggest for the consideration of Government whether it would not be advisable to offer a handsome reward, say Rs. 1,000, for a really efficient lift suitable to the needs of the average ryot. A similar but much smaller reward was fruitlessly offered once before, but progress has since been made, and the offer of a substantial reward will direct attention to the subject and may lead to valuable results. The main conditions of the competition might be—

(1) that it should be restricted to lifts adapted to raising water 20 feet or more, and which can be sold at a price not exceeding Rs. 150 each;

(2) that intending competitors should submit working drawings of the essential parts of their machines before a date to be fixed, with an approximate estimate of the price, or cost of construction;

(3) that the plans should be scrutinized by a committee which would select for trial such of the designs as might appear to possess sufficient merit;

(4) that each inventor of a selected design should then, within a fixed date, put up his lift in working order, at some place in the neighbourhood of Madras;

(5) that he should then be entitled to receive from Government the price of the machine as per estimate submitted to the committee;

(6) that the competing machines should then be subjected to experiment; and that the best in respect of novelty, cheapness, simplicity, efficiency, durability, adaptability for being worked with different sorts of animal power, and at different depths, and the ease with which it can be repaired, should receive the prize.

The Government, while agreeing with the suggestion, commended it to the consideration of the Supreme Government, as it thought that the proposal was not one of merely local interest, but affects also the whole of India. The Supreme Government did not, however, approve the proposal of the offer of prizes for the best water-lifts, but desired that the question of various agricultural implements in use in India should be discussed with the Agricultural Chemist to the Government of India who was deputed for the purpose. That officer visited Madras at the close of the year and the decision as to what further action should be taken is still under discussion. In connection with the proposals above referred to, the Government reviewed the general question of agricultural exhibitions and desired that the question should be discussed with Sir E. Buck at the time of his visit. The committee appointed, however, upheld the decision arrived at during 1890 on the subject, but assented to the proposals of Mr. Benson regarding the offer of prizes for cattle in breeding localities, and also to encourage any local body or association that voluntarily came forward to organize a show, by giving a grant-in-aid as well as by helping them with illustrative exhibits. No orders have, as yet, been received on the matter.

33. *Entomology.*—During June 1895, the Collector of Malabar sent in a specimen of caterpillars, which were causing damage to the paddy crop in Chirakkal taluk, with a view to ascertaining how they might be extirpated. These were forwarded through the Superintendent, Central Museum, to the Indian Museum for identification. The report from the Indian Museum states that the specimens being larvæ could not possibly be determined; but that they, however, appeared to be the caterpillars of a "*noctues* moth" (possibly *Heliothis Armigera*); no remedy for them was suggested. Another specimen of insects was received from the same Collector in September 1895, which were said to have caused considerable damage to paddy in Ponnáni taluk. The Superintendent, Indian Museum, identified this to be the common rice hispa (*Hispa œnescens* Baby). The Deputy Director of Land Records and Agriculture having heard that certain insects were causing damage in some villages near Poonamalli, deputed an Agricultural Inspector to make enquiries regarding them. The Inspector sent eight specimens of the insects which were forwarded to the Indian Museum, but only one has been identified by it to be *Heliothis Armigera.*

34. *Destruction of prickly-pear.*—On a letter from the Sanitary Commissioner to Government suggesting the desirability of requesting the Collectors of districts and other authorities to make enquiries as to whether any animal or vegetable parasites have been anywhere observed or can be found feeding upon the prickly-pear in such a manner as to warrant a hope that it might be used as an agency for destroying the said plant, the Government called for a joint report from this department and the Superintendent, Central Museum, after making the necessary enquiries as suggested. From the reports of the Collectors, the Board and the Superintendent formed the opinion that there are no parasites known in this Presidency which can be relied on to destroy prickly-pear growth, and the joint report was accordingly submitted to Government.

35. *Societies.*—The permanent Director continued to be an *ex-officio* member of the committee of the Madras Agri-Horticultural Society throughout the year. The total income of the society amounted to Rs. 11,318, of which Rs. 4,000 was from Government grants and Rs. 1,763 from subscriptions. The total number of members of the society again fell off by eight, though there were sixteen additions during the year. The usual annual flower-show was held on the 23rd February, and the attendance was larger than on any previous occasion. The library was also strengthened both by gratuitous supply and by the purchase of books. Several new plants were also added to the gardens. The usual system of exchanging seeds and plants was also continued.

36. *Collections for the Imperial Institute.*—During the year under report, the Reporter, Economic Products, called for collections of the following articles:—

(*a*) Two gallons of—

(1) Mustard oils of different kinds,
(2) Oil of *Bassia longifolia* (Elupa),
(3) Cocoanut oil of different kinds,
(4) Cashew-nut oil (*Anacardium occidentale*), and
(5) Any other edible oils used in the Presidency, except sesamum and ground-nut oils.

Ten pounds of the seed or kernel from which the oil was extracted, and the whole of the oil-cake produced were also required, together with the information regarding the quantity of seed for producing the two gallons.

(*b*) (1) *Acampe papillosa* (plant and drug).
(2) *Dodonœa viscosa* (leaves and wood).
(3) *Eriodendron anfractuosum* (fibre).
(4) *Erythroxylon monogynum* (leaves and oil).
(5) *Gymnema sylvestre* (roots and leaves).
(6) *Lathyrus sativus* (oil and seeds).
(7) *Litsœa zeylanica* (do.).
(8) *Macaranga Roxburghii* (gum and plant).
(9) *Memecylon edule* (leaves, flowers and bark).
(10) *Lettsomia elliptica.*

All the oils under group (*a*), except mustard oils, were obtained and forwarded to the Reporter, together with the seeds and oil-cakes. A specimen of the oil extracted from the seeds of Dhup tree (*Vateria Indica*), which was reported by the Collector of South Canara to be used for flavoring food, was also sent. Of the articles mentioned in group (*b*), No. 2 was departmentally obtained and supplied, while Nos. 4, 5 and 8 were obtained from Collectors and forwarded. Regarding article No. 10, the Reporter was requested to address the British Resident in Mysore. Steps have been taken to collect the rest so far as they are procurable. The collection of these samples imposes a good deal of trouble on the District Officers, to whose assistance it is, in most cases, necessary to have recourse.

VI.—CATTLE BREEDING AND VETERINARY ESTABLISHMENTS.

37. *Civil Veterinary Department.*—The office of Superintendent, Civil Veterinary Department, in Madras was filled by Mr. Harris till the beginning of September, when he proceeded on sick leave. He was succeeded by Mr. Clarke, who reported himself for duty on the 26th September 1895, and continued in charge till the end of March 1896. The former officer spent four days on tour, the latter fifty-two. The small amount of touring done by Mr. Harris was due to ill-health. Mr. Clarke's work shows an improvement in the direction desired by the Government of India, but it is desirable that the greater part of the time of the Superintendent, when he is not lecturing at Saidapet, should be spent in the districts. Mr. Clarke delivered three courses of lectures on Veterinary Science to the classes in the Agricultural College; they comprised thirty-six lectures and nineteen classes, for which he was detained two and-a-half months at Madras. Endeavours are being made to improve this state of affairs, so that the Superintendent's time at Saidapet may be more adequately utilized.

38. The arrangements made for carrying on the enquiries required for the Bacteriological Survey were brought into force during the year, and five districts, in several of which pony-breeding is going on, were taken up for more particular investigation, though it is not intended that the enquiries shall be limited to this area when cause for special enquiries arises elsewhere. In fact two such investigations were in progress during the year—one regarding a disease called *Iduga*, found to prevail amongst the cattle that are sent to graze in the Colair Lake, and another regarding the very large number of deaths returned from unspecified causes in several districts. The former enquiry has been closed; the latter is not proceeding as rapidly as could be desired.

Reports appear to have been received by the Superintendent regarding many outbreaks of disease, but the manner in which their enquiries have been conducted by the Stock Inspectors is not noted by him. The reports, as received, also seem to have

been forwarded to the Assistant to the Inspector-General, Civil Veterinary Department, but it does not appear that in any case the diagnosis of his subordinates was checked by the Superintendent. For this it will be necessary for him to be constantly on tour, which will also be necessary in order to enable him to direct and control the work of the Stock Inspectors effectually.

39. Information is reported to have been collected regarding the breeds of cattle found in the five districts more particularly taken up for enquiry. It is hoped that the Superintendent will soon be able to prepare a complete account of the cattle of these districts.

40. Of the thirteen Stock Inspectors, six, eligible for promotion to the grade of Rs. 100, were examined by a special Board appointed by Government, and five of them who were successful were promoted. One more, who became eligible since, was also promoted to Rs. 100 without departmental examination, as he had passed the Bombay course.

41. *Pony-breeding.*—During the year, one stallion died and two were condemned and sold, but six new stallions were purchased. Thus at the end of the year there were ten stallions working in Coimbatore and three in Salem. One stallion has also been provided for a part of the Madura district that adjoins Coimbatore. The new stallions were all purchased by the Inspector-General, Civil Veterinary Department, who visited the Coimbatore and Salem districts during the year to make himself acquainted with the pony stock kept there and submitted a special report thereon. These new stallions are all smaller than those previously obtained and it is hoped that they will be more suitable to this Presidency.

The castration of 134 ponies was performed at Hósúr during the year as against 116 in the previous year, and 98 in Coimbatore against none in the previous year. The castration work in the latter district was confined to only one taluk—(Kollegal).

The number of mares covered by Government stallions during the year was 398, which is a smaller number than in either of the two preceding years. The average number covered by each stallion that was working throughout the year was 37·9, which is low. In Salem, the small number must be ascribed to the more strict enforcement of the rule regarding the size of the mares to be accepted for any stallion. In Coimbatore, the smallness of the number of coverings is put down to various causes, none of which appear to apply generally to the uniformly poor work done by most of the stallions; one, however, appears to have been too large for work in Kollegal, and has been replaced there by a smaller stallion.

The results reported of the coverings made during 1894–95 are rather more satisfactory than those for the year preceding. For 455 mares covered, the results are reported in 301 cases, and the inspections of the Deputy Superintendent, Civil Veterinary Department, in 229 cases are stated to generally confirm the reports obtained by the Revenue Department. Of the above 301 mares, 79 dropped foals and 30 aborted, leaving 192 or 64 per cent. empty. In Salem, the percentage of unsuccessful coverings reported was 72, and in Coimbatore 61. The young stock dropped to Government stallions is, as shown in the reports of the recent shows, of good quality in Coimbatore; but in Salem it is very poor.

Two pony-shows were held during the year—one at Tiruppúr in June 1895, and the other at Adamancottah during March 1896. The former show was a success, while the latter was not satisfactory.

42. *Mule-breeding.*—With a view to making a commencement in this direction, four donkey stallions were purchased during the year and sent to Babugârh to be trained. They arrived at Hósúr shortly before the end of the year, and will be stationed in the Salem and Coimbatore districts.

43. *Cattle Fairs.*—With a view to controlling the spread of cattle disease from the great cattle fairs, the Collectors of all districts were called upon to consider carefully whether the Cattle Disease Act should not be put into force in connection with the chief cattle fairs and markets in their districts. Hitherto, the Act had been put into force only in connection with the two cattle fairs, viz., the Chittrai cattle fair at Madura, and Subramaniya cattle fair in South Canara. But, during the year under report, it was introduced in connection with certain other fairs also held in South Arcot, Salem, Tanjore and Tinnevelly districts at the desire of the Collectors of those districts.

44. *Mortality amongst Live-stock.*—The subjoined table compares the mortality reported during the year, with that in the preceding year and with the average for the five years ending 1894–95 :—

Causes of death.	Number amongst cattle.			Number amongst horses and ponies.		
	Average for five years ending 1894–95.	In 1894–95.	In 1895–96.	Average for five years ending 1894–95.	In 1894–95.	In 1895–96.
Diseases.						
Rinderpest	14,523	13,974	21,475	..	..	..
Diarrhœa and dysentery	21,435	9,825	11,089	13	4	44
Total ..	35,958	23,799	32,564	13	4	44
Anthrax	17,980	16,123	17,746	20	13	5
Foot and mouth diseases	6,961	7,545	3,477	..	..	..
Variola	2,103	1,806	2,063	..	..	..
All others	30,793	35,947	36,439	147	155	163
Total from diseases ..	93,795	85,220	92,289	180	172	212
Other causes.						
Snake-bite	2,257	2,597	2,656	7	16	8
Wild animals	10,427	10,750	10,566	172	204	119
Criminal poisoning	24	35	21	..	..	..
Total from other causes ..	12,708	13,382	13,243	179	220	127
Grand total ..	106,503	98,602	105,532	359	392	339

45. *Cattle Disease.*—The total losses of cattle from disease were about 8 per cent. greater than in the previous year, but were below the average by 1·65 per cent. The increase, as compared with the previous year, occurred chiefly under rinderpest, while there was a large decrease under foot and mouth disease. The losses from rinderpest were nowhere very large except in Bellary, in which district one-third of the total losses from this disease reported for the Presidency occurred. In Anantapur, the losses were also considerable and they were noticeable also in South Arcot and South Canara. In Bellary and South Arcot, a considerable number of deaths were put down to diarrhœa and dysentery, some of which may have been actually caused by rinderpest. Taking these causes of death together, it was not until October 1895 that any serious increase in the mortality recorded appeared, and in December it again decreased, only, however, to increase again during the closing months of the year, during which the disease caused very considerable losses in Bellary and Anantapur. The attention of the Superintendent has been specially called to this outbreak.

Anthrax is reported to have caused about 1,600 more deaths than in the preceding year, but not so many as have been recorded on the average. The largest number of deaths reported from this disease occurred in Gódávari, South Arcot, Tanjore and Chingleput, but they were numerous also in Kistna, Kurnool and Bellary. The heaviest mortality occurred during the months from July to November, although in September there was a marked decrease on the number reported in August; as the dry weather set in, the deaths from this disease decreased.

The decrease in the mortality from epizootic aphtha occurred principally in the districts of Ganjám and Chingleput, where deaths from this cause were numerous in the previous year; but still the losses in these districts and in Gódávari were considerable. More than half the deaths attributed to variola were reported from three districts—Ganjám, Kistna and Salem and occurred chiefly in the months of July, August and November. A large number of deaths from unspecified diseases has been reported from Gódávari, Kistna, Kurnool, Bellary and Anantapur; and an investigation of the causes for this has been undertaken, but as yet no report has been received.

46. Taking the losses from all diseases together, the death-rate was very high in Bellary, and exceeded 10 per *mille* in Kurnool and Anantapur, whilst the losses in Gódávari amounted to 9·5 per *mille*. Special arrangements have been recently made for carrying on an investigation, on the lines required for the Bacteriological Survey, in Bellary and Anantapur, the serious losses in these districts not having attracted the notice of the Board until May last.

The subjoined table compares the total number of deaths recorded amongst horned cattle and horses during the year, and the numbers returned in previous years so far as Government villages are concerned. It shows that the death-rate was below the average for the former, and slightly above it for the latter description of stock. The registration of deaths of sheep and goats from disease has been abandoned :—

Year.	Horned cattle.			Horses and ponies.		
	Number of		Death-rate per *mille*.	Number of		Death-rate per *mille*.
	* Stock.	Deaths.		* Stock.	Deaths.	
1890-91	14,959	102,097	6·8	43	199	4·6
1891-92	14,849	87,349	5·9	42	155	3·7
1892-93	14,342	101,990	7·1	40	142	3·5
1893-94	16,192	86,554	5·3	41	226	5·5
1894-95	16,112	82,217	5·1	37	171	4 6
Average ..	15,291	92,041	6·0	41	179	4·4
1895-96	16,327	† 90,102	5·5	41	† 208	5·1

* Thousands.

† Excludes figures for permanently-settled estates, information regarding agricultural stock in such estates not being available.

47. *Other Causes.*—The attempt to register the deaths caused by natural decay and accidents was discontinued during the year under the orders of Government, and the variations in numbers of deaths appearing under other heads were small and the total losses not severe. Deaths caused by wild animals were, as usual, most numerous in the West Coast districts. Only twenty-one deaths were reported as due to criminal poisoning during the year, or fourteen less than in the previous year. The subjoined statement shows the action taken in these cases :—

District.	Number of cattle poisoned.	Action taken.
Gódávari	3	In two cases the owner did not suspect anybody in particular, and the offender could not be traced. In the third case the accused was sentenced to four months' rigorous imprisonment and a fine of Rs. 10 and in default to one month's additional imprisonment.
Kistna	3	In one case the accused was sentenced to six months' rigorous imprisonment and in the other two cases the accused was tried but discharged.
Anantapur	2	In one case the accused was acquitted for want of sufficient evidence ; as regards the other no report has yet been received.
Nellore	7	In three cases the accused were discharged for want of evidence, and in the other four cases no evidence was forthcoming to connect anyone with the offences.
Coimbatore	3	In one case the owner not suspecting any particular person, no steps were taken to detect the offender ; in another the Chemical Examiner certified that there was no poison in the viscera of the animal ; and in the third the accused was killed by the owner who has since been convicted and punished for murder.
Trichinopoly	1	In this case the offenders were sentenced to three months' rigorous imprisonment.
Tanjore	2	The owner not suspecting any particular person, the offenders could not be detected.
Total ..	21	

VII.—MISCELLANEOUS.

48. No change was made during the year in the number and dates of issue of crop forecasts prescribed by the Government of India which were all duly published on or about the dates shown in the subjoined statement :—

Crops.	Reports.		
	Sowings.	Forecast (first).	Forecast (second).
Paddy	15th October ..	17th December ..	15th February.
Indigo	14th September ..	15th December ..	..
Gingelly (early) ..	11th August ..	1st November ..	..
Do. (late) ..	22nd December ..	18th April	..
Cotton	11th August (first) .. 10th October (second).	10th December ..	9th February.

49. *Exploration for Minerals.*—Mr. Middlemiss continued his exploration of the corundum areas in Coimbatore during the year, and extended those previously commenced in Salem over a new portion of the district. During the cool season he was assisted by Mr. F. H. Smith, and the Director of the Geological Survey states these officers have largely extended the recorded occurrences of magnetite and hæmatite beds in the northern taluks of those districts, and have discovered several new corundum localities in the Hosúr taluk. Mr. Middlemiss' reports on the magnesite areas nem Salem, and on some of the corundum localities in Salem and Coimbatore, were published during the year, and, since its close, he has submitted a supplementary note which is now in course of publication. These reports are being reprinted for the Agricultural Ledger of the Government of India. Mr. Middlemiss has also revised Dr. King's Index of the important minerals found in the Presidency by the addition of information obtained from Revenue Officers, and his own observations. It is hoped that this will serve the purpose of the conspectus required by the Government of India, and the Director of the Geological Survey is being consulted as to the preparation of a working plan for future explorations.

50. *Rail-borne Trade of the Presidency.*—No change was made in the arrangements for the compilation of the quarterly and the annual returns. The latter, which are compiled from the quarterly returns, will be issued shortly with a separate review. They show that the total amount of the rail-borne trade of the Presidency during 1895–96 was the largest recorded since registration began, and was about 6 per cent. more in volume and 6·7 per cent. greater in value than in the preceding year. The increase is chiefly due to the extension of the East Coast lines. The subjoined statement summarises the figures for the last five years :—

Years.	Imports.		Exports.		Internal.		Total.	
	* Amount.	† Value.	* Amount.	† Value.	* Amount.	† Value.	* Amount.	† Value.
	MDS.	RS.	MDS.	RS.	MDS.	RS.	MDS.	RS.
1891–92 ..	7,027	5,25	4,717	3,61	27,305	19,79	39,049	28,65
1892–93 ..	7,257	5,53	5,399	4,16	24,110	20,44	36,766	30,13
1893–94 ..	7,661	5,64	6,125	4,46	25,021	21,45	38,807	31,55
1894–95 ..	8,645	6,66	6,571	4,65	30,802	27,85	46,018	39,16
1895–96 ..	8,943	6,69	7,330	4,82	32,521	30,27	48,794	41,78

* Thousands of maunds. † Lakhs of rupees.

The increase as compared with the previous four years occurred under each group, viz., imports, exports and internal. The largest increases occurred in the internal trade, being 21·3 per cent. in volume and 35· per cent. in value. The imports from other provinces amounted to 8·94 millions of maunds, of which about 3,851,000 maunds consisted of coal and coke, almost entirely from the Nizam's Dominions, and 1,611,000 maunds of grain and pulses. Compared with the previous year, there was an increase of nearly 3,00,000 maunds or 3·4 per cent. in the volume, and 3 lakhs or nearly $\frac{1}{2}$ per cent. in the value of this trade. The increase was partly due to the increased imports of coal and partly to larger imports of oil-seeds (chiefly castors), amounting to 267,000 maunds more than in the previous year, also from Hyderabad. On the other hand, the imports of grain and pulse fell off from 1,876,000 maunds to 1,610,000 maunds in the year, the decrease occurring chiefly in the imports of paddy and ragi from Mysore.

The exports to other provinces increased by nearly 759,000 maunds or $11\frac{1}{2}$ per cent. in volume and by 3·6 per cent. in value. The increase occurred in the exports of coal and coke to Mysore (the Kolar gold fields) and in grain and pulse; chiefly rice sent to the same Province from the Northern Deltas and the districts of the Garnatic. The internal trade of the Presidency increased by 1,719,000 maunds or 5·6 per cent. in volume and by 242 lakhs or 8·7 per cent. in value, the increase occurring chiefly under coal and coke, stone and lime, metals, sugar and railway plant and rolling stock.

51. The distribution of the total trade of the Presidency among the different blocks into which it is divided for purposes of registration is shown below :—

Internal blocks of the Presidency.	Imports.								
	1894–95.				1895–96.				
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		Percentage of increase or decrease.
			Quantity.	Percentage.			Quantity.	Percentage.	
1	2	3	4	5	6	7	8	9	10
Sea-ports.	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Vizagapatam ..	3,323	799,995	803,318	2·0	6,711	1,453,006	1,459,717	3·5	+ 81·7
2. Cocanada ..	569,864	900,221	1,470,085	3·7	744,974	1,077,919	1,822,893	4·4	+ 24·0
3. Madras ..	1,321,702	5,772,914	7,094,616	18·0	1,434,904	6,633,269	8,068,173	19·5	+ 13·7
4. Pondicherry ..	17,113	1,117,211	1,134,324	2·9	6,620	717,240	723,860	1·7	— 36·1
5. Cuddalore ..	3,111	714,598	717,709	1·8	2,562	656,312	658,874	1·6	— 8·2
6. Negapatam ..	11,242	1,342,884	1,354,126	3·4	16,208	1,173,585	1,189,793	2·9	— 12·1
7. Tuticorin ..	22,909	1,187,386	1,210,295	3·1	31,803	1,222,890	1,254,693	3·0	+ 3·6
8. Calicut	57,554	812,215	869,769	2·2	53,078	554,228	607,306	1·5	— 30·0
Internal blocks.									
9. Northern Circars ..	239,878	1,257,315	1,497,193	3·8	420,663	1,239,661	1,660,324	4·0	+ 10·9
10. Kistna and Gódávari	3,512,374	279,894	3,792,268	9·6	3,417,895	313,533	3,731,428	9·0	— 1·6
11. Deccan Districts ..	972,028	1,341,907	2,313,935	5·9	1,133,599	1,466,323	2,599,922	6·3	+ 12·3
12. Chingleput and North Arcot ..	508,411	2,294,559	2,802,970	7·1	464,096	2,295,462	2,759,558	6·7	— 1·5
13. South Arcot and Tanjore ..	78,094	4,069,809	4,147,903	10·5	107,349	3,731,313	3,838,662	9·3	— 7·4
14. Salem, Coimbatore and Trichinopoly.	1,066,224	3,784,639	4,850,863	12·3	888,519	4,531,424	5,419,943	13·0	+ 11·7
15. Madura and Tinnevelly	99,939	4,393,689	4,493,628	11·4	89,793	4,647,586	4,737,379	11·4	+ 5·4
16. Malabar	161,426	733,023	894,449	2·3	123,993	807,372	931,365	2·2	+ 4·1
Total ..	8,645,192	30,802,259	39,447,451	100·0	8,942,767	32,521,123	41,463,890	100·0	+ 5·1

Internal blocks of the Presidency.	Exports.								
	1894–95.				1895–96.				
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		Percentage of increase or decrease.
			Quantity.	Percentage.			Quantity.	Percentage.	
	11	12	13	14	15	16	17	18	19
Sea-ports.	I. MDS.	I. MDS.	I. MDS.		I. MDS.	I. MDS.	I. MDS.		
1. Vizagapatam ..	8,499	859,800	868,299	2·3	953	897,485	898,438	2·3	+ 3·4
2. Cocanada	46,966	354,590	401,556	1·1	185,771	317,789	503,560	1·3	+ 25·4
3. Madras	3,033,410	3,705,356	6,738,766	18·0	3,589,863	4,231,019	7,820,882	19·6	+ 16·0
4. Pondicherry ..	1,482	62,870	64,353	0·2	1,936	44,897	46,833	0·1	— 26·5
5. Cuddalore	1,014	942,977	943,991	2·5	1,643	854,586	856,229	2·1	— 9·2
6. Negapatam ..	2,779	1,114,206	1,116,985	3·0	1,815	932,514	934,329	2·3	— 16·3
7. Tuticorin	949	1,735,606	1,736,555	4·6	461	2,278,179	2,278,640	5·7	+ 31·2
8. Calicut	49,425	559,715	609,140	1·6	60,031	717,707	777,738	1·9	+ 27·6
Internal blocks.									
9. Northern Circars ..	33,247	1,322,868	1,356,115	3·6	40,513	2,309,406	2,349,919	5·9	+ 73·2
10. Kistna and Gódávari	666,384	1,199,614	1,865,998	5·0	888,193	1,188,944	2,077,137	5·2	+ 11·3
11. Deccan Districts ..	1,022,612	2,188,460	3,211,072	8·6	892,786	2,804,820	3,697,606	9·3	+ 15·1
12. Chingleput and North Arcot ..	382,428	4,761,416	5,143,844	13·8	400,023	5,318,443	5,718,466	14·3	+ 11·2
13. South Arcot and Tanjore	139,405	5,332,964	5,472,369	14·7	169,073	4,461,874	4,630,947	11·6	— 15·4
14. Salem, Coimbatore and Trichinopoly.	867,671	3,553,270	4,420,941	11·8	763,491	3,048,014	3,811,505	9·7	— 11·5
15. Madura and Tinnevelly	6,129	1,886,994	1,893,123	5·1	4,707	1,757,739	1,762,446	4·4	— 6·9
16. Malabar	308,325	1,221,552	1,529,877	4·1	328,327	1,357,707	1,686,034	4·3	+ 10·2
Total ..	6,570,725	30,802,259	37,372,984	100·0	7,329,586	32,521,123	39,850,709	100·0	+ 6

The marked features are a falling off of the imports into Pondicherry and Calicut, and the development of the imports into the two northern sea-ports; a falling off in the traffic inland from Pondicherry, and the development of that from Cocanada, Tuticorin and Calicut; the enormous increase in the exports from the districts lying north of the Gódávari, but a slackness in those from all the districts lying to the south of Madras.

52. *Road Traffic.*—Out of the twenty-six stations selected during 1894–95, at which traffic was ordered to be registered for a continuous period of three years, the work at seventeen stations was completed for the prescribed period, and fresh stations in their stead were selected during the year. Since the introduction of the above system during 1893–94, registration has been completed for the full period at nineteen stations in all. The registry of traffic at Dáchépalli in Kistna district, one of the seventeen originally selected for registration purposes, was, on the recommendation of the Superintending Engineer, given up in favour of Pidugurella in the same district, as the Collector was of opinion that it would be more useful to have the registration carried on at the latter station.

The table below shows the different roads and stations where traffic was registered during 1895–96:—

District.	Description of the roads.	Registering stations.	Years completed.
Ganjám	Aska road	(1) Russellkonda	1890–91, 1895–96.
		(2) Purushottapur	
		(3) Iyengalli	
Vizagapatam ..	Vizianagram-Párvatípuram ..	(4) Párvatípuram	1890–91, 1894–95 and 1895–96.
		(5) Ramabhadrapuram ..	
Kistna	Guntúr and Hyderabad ..	(6) Pidugurella	1890–91, 1895–96.
Nellore	Madras to Guntúr	(7) Kavali	1893–94 to 1895–96.
	Cumbum to Ongole	(8) Chinnarikutla	1891–92, 1895–96.
		(9) Lingamgunta	
Cuddapah	Nellore and Badvél	(10) Sangam	1888–89, 1895–96.
		(11) Badvél	
Coimbatore ..	Trichinopoly to Palghat *viâ* Kángayam.	(12) Karúr	1892–93, 1895–96.
		(13) Kángayam	
		(14) Palladam	
		(15) Coimbatore	
Madura	Dindigul-Polláchi	(16) Palni	1893–94 to 1895–96.
Tinnevelly ..	Madura to Tinnevelly *viâ* Srívilliputtúr.	(17) Tirumangalam	1890–91, 1895–96.
		(18) Rajapalayam	Do. do.
		(19) Sankaranayinárkóyil ..	
Malabar	Malabar and Cochin	(20) Shoranur	1893–94 to 1895–96.
	Calicut and South Canara ..	(21) Quilandi	Do. do.
	To and from South Canara by canal.	(22) Sultan Tod	1892–93, 1895–96.
	Between Mysore, Wynaad and the coast, up and down the ghat.	(23) Kúttaparamba	
South Canara ..	Mangalore, Coorg and Mysore.	(24) Uppinangadi	1893–94 to 1895–96.
		(25) Beltangadi	
		(26) Puttúr	

APPENDIX I.

Statistics of Mortality reported among Cattle in the Madras Presidency during the year 1895–96.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.								Deaths due to other causes.			Total deaths from all causes.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.		Snake-bite.	Wild animals.	Criminal poisoning.	Number.	Rate per *mille*.
								Number.	Rate per *mille*.					
Ganjám	14,703	773	722	647	453	688	1,125	4,408	2·9	64	225	..	4,697	3·2
Vizagapatam	1,532	277	132	319	88	33	753	1,602	10·5	56	175	..	1,833	12·0
Gódávari	11,688	608	970	3,351	457	192	5,584	11,162	9·5	235	565	3	11,965	10·2
Kistna	11,459	229	402	1,036	132	315	2,942	5,056	4·4	175	134	3	5,368	4·7
Kurnool	6,297	1,619	156	1,022	87	17	4,578	7,479	11·9	104	501	..	8,084	12·8
Bellary	5,241	6,998	2,493	1,071	201	57	3,172	13,992	26·7	29	171	..	14,192	27·1
Anantapur	5,787	4,164	541	301	118	5	3,382	8,511	14·7	36	225	2	8,774	15·2
Cuddapah	10,223	778	404	664	92	87	2,082	4,107	4·0	93	710	..	4,910	4·8
Nellore	6,217	225	233	603	48	16	1,616	2,741	4·4	57	91	7	2,896	4·7
Chingleput	5,865	223	734	1,511	159	12	1,021	3,660	6·2	407	26	..	4,093	7·0
South Arcot	11,321	2,650	1,356	2,519	395	31	1,791	8,742	7·4	218	128	..	9,088	7·7
North Arcot	9,297	176	191	533	81	..	469	1,450	1·6	210	649	..	2,369	2·5
Salem	8,933	283	136	126	196	411	483	1,635	1·8	49	210	..	1,894	2·1
Coimbatore	11,050	64	133	451	110	39	2,291	3,088	2·8	108	867	3	4,066	3·7
Trichinopoly	5,918	57	84	192	28	..	536	897	1·5	51	51	1	1,000	1·7
Tanjore	9,478	434	910	1,520	222	4	1,406	4,496	4·7	196	11	2	4,705	5·0
Madura	6,091	150	283	786	142	109	1,248	2,718	4·5	131	282	..	3,131	5·1
Tinnevelly	4,893	129	240	324	19	5	460	1,177	2·4	132	148	..	1,457	3·0
Nilgiris	677	27	22	19	15	..	66	149	2·2	12	493	..	654	9·7
Malabar	9,008	157	261	12	125	5	342	902	1·0	132	2,372	..	3,406	3·8
South Canara	7,095	1,195	340	51	211	3	330	2,130	3·0	29	2,259	..	4,418	6·2
Total ..	163,273	21,216	10,743	17,058	3,379	2,029	35,677	90,102	5·5	2,524	10,293	21	102,940	6·3
In zemindaris—														
Vizagapatam	Not available.	114	307	247	60	34	366	1,128	..	32	57	..	1,217	..
Nellore		39	1	21	..	..	144	205	..	..	..	..	205	..
North Arcot		106	38	420	38	..	252	854	..	100	216	..	1,170	..
Total ..	..	259	346	688	98	34	762	2,187	..	132	273	..	2,592	..
Grand Total ..	..	21,475	11,089	17,746	3,477	2,063	36,439	92,289	..	2,656	10,566	21	105,532	..

APPENDIX II.

MONTHLY STATISTICS of Mortality reported among Cattle in the Madras Presidency during the year 1895–96.

Months.	Deaths due to diseases.							Deaths due to other causes.			Total deaths from all causes.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola.	All other diseases.	Total.	Snake-bite.	Wild animals.	Criminal poisoning.	
April 1895 ..	1,082	759	892	384	150	2,318	5,585	195	761	..	6,541
May ,, ..	1,673	844	1,163	244	104	2,803	6,831	175	793	1	7,800
June ,, ..	1,316	714	1,275	305	172	3,489	7,271	184	730	2	8,187
July ,, ..	1,635	805	2,173	213	332	4,072	9,230	275	939	1	10,445
August ,, ..	1,360	938	2,081	304	229	3,710	8,622	266	967	1	9,856
September ,, ..	1,216	979	1,545	415	191	3,384	7,730	289	1,031	2	9,052
October ,, ..	1,617	992	2,180	289	189	3,784	9,051	298	1,148	1	10,498
November ,, ..	2,581	1,350	2,026	250	291	3,664	10,162	292	1,012	3	11,469
December ,, ..	1,704	1,116	1,556	318	170	3,071	7,935	229	1,020	1	9,185
January 1896 ..	1,995	906	1,156	331	134	2,472	6,994	200	883	..	8,077
February ,, ..	2,375	897	714	246	58	1,832	6,122	142	659	3	6,925
March ,, ..	2,921	789	985	178	43	1,840	6,756	112	623	6	7,497
Total ..	21,475	11,089	17,746	3,477	2,063	36,439	92,289	2,656	10,566	21	105,532

APPENDIX III.

STATISTICS of Mortality reported among Horses and Ponies in the Madras Presidency during the year 1895–96.

Districts.	Total stock by latest census in hundreds.	Deaths due to diseases.					Deaths due to other causes.			Total deaths from all causes.	
		Diarrhœa and dysentery.	Anthrax.	All other diseases.	Total. Number.	Total. Rate per *mille*.	Snake-bite.	Wild animals.	Criminal poisoning.	Number.	Rate per *mille*.
Ganjám	2	2	..	3	5	2·5	..	..	..	5	2·5
Vizagapatam	2	..	1	2	3	1·5	..	..	..	3	1·5
Gódávari	24	3	..	20	23	9·6	1	4	..	28	11·7
Kistna	38	1	2	4	7	1·8	1	5	..	13	3·4
Kurnool	28	1	..	24	25	8·9	1	30	..	56	20·0
Bellary	38	19	..	30	49	12·9	..	5	..	54	14·2
Anantapur	34	..	..	20	20	5·9	..	7	..	27	7·9
Cuddapah	21	..	1	16	17	8·1	..	9	..	26	12·4
Nellore	11	..	..	2	2	1·8	..	..	..	2	1·8
Chingleput	14	16	..	4	20	14·3	1	..	..	21	15·0
South Arcot	27	..	1	6	7	2·6	3	1	..	11	4·1
North Arcot	21	..	..	2	2	1·0	..	1	..	3	1·4
Salem	32	..	..	..	..	..	..	..	..	..	..
Coimbatore	49	..	..	9	9	1·8	..	8	..	17	3·5
Trichinopoly	8	..	..	2	2	2·5	..	..	..	2	2·5
Tanjore	13	..	..	2	2	1·5	..	..	..	2	1·5
Madura	19	..	..	3	3	1·6	1	11	..	15	7·9
Tinnevelly	6	1	..	..	1	1·7	..	1	..	2	3·3
Nilgiris	16	..	..	10	10	6·3	..	36	..	46	28·7
Malabar	9	..	..	..	..	..	..	..	..	..	..
South Canara	2	1	..	..	1	5·0	..	..	..	1	5·0
Total ..	414	44	5	159	208	5·0	8	118	..	334	8·1
In zemindaris—											
Vizagapatam	..	..	..	1	1	..	..	..	..	1	..
Nellore	..	..	..	..	..	..	..	..	..	..	..
North Arcot	..	..	..	3	3	..	..	1	..	4	..
Total ..	..	..	..	4	4	..	..	1	..	5	..
Grand Total ..	..	44	5	163	212	..	8	119	..	339	..

APPENDIX IV.

MONTHLY STATISTICS of Mortality reported among Horses and Ponies in the Madras Presidency during the year 1895–96.

Months.	Number of deaths due to diseases.				Deaths due to other causes.			Total deaths from all causes.
	Diarrhœa and dysentery.	Anthrax.	All other diseases.	Total.	Snake-bite.	Wild animals.	Criminal poisoning.	
April 1895	1	..	8	9	1	11	..	21
May „	..	2	11	13	1	14	..	28
June „	1	..	22	23	2	16	..	41
July „	27	1	18	46	1	6	..	53
August „	1	1	19	21	..	19	..	40
September „	1	1	26	28	..	5	..	33
October „	..	..	13	13	1	10	..	24
November „	9	..	16	25	1	6	..	32
December „	3	..	4	7	1	14	..	22
January 1896	..	..	8	8	..	3	..	11
February „	..	..	4	4	..	14	..	18
March „	1	..	14	15	..	1	..	16
Total ..	44	5	163	212	8	119	..	339

Resolution of the Board of Revenue (R.S., L.R. and Agri.), dated 2nd September 1896, No. 209.

The Board begs to submit, for the information of Government, its report on the operations of the Department of Land Records and Agriculture during 1895–96.

2. The Hon'ble Mr. H. M. Winterbotham continued to be in charge of the department up to the first week of March 1896, when he was deputed on special duty to Malabar in connection with the Moplah riots. The department was in charge of the Land Revenue Commissioners during the rest of the year.

3. The Deputy Director, Mr. Benson, continued in charge of both the Land Record and the Agricultural Branches during the year, and, except during April, the whole or part of the remaining months of the year was spent by him on tour, during which he visited the districts of Coimbatore, Salem, Chingleput, Cuddapah, Bellary, Kistna, Anantapur, Tinnevelly, Tanjore and Madura, in connection with the inspection of the village and taluk accounts and the revision of the existing manuals. At the close of the Christmas holidays he proceeded to Poona and Belgaum to acquaint himself with the Bombay system of working the village cash accounts. He also attended the Pony shows at Tiruppúr and Adamancottah and was engaged on the committee appointed for the trial of certain water-lifts. As usual, he discharged, in addition, a certain amount of secretariat work under the Board.

Order—No. 701, Revenue, dated 8th December 1896.

Miscellaneous.

With the Proceedings read above, the Board of Revenue submits its report on the operations of the Department of Land Records and Agriculture for the year 1895–96.

2. As will appear from the Board's introductory remarks, several important questions having reference to the administration of the Department were under consideration during the year under review, some of which were referred to a Committee of experienced officers specially appointed for the purpose of discussing them at conferences held with Sir Edward Buck during that officer's visit to Madras in November and

December 1895. The recommendations of these Committees as well as the conclusions arrived at by His Excellency the Governor in Council in connection therewith have since been placed before the Government of India.

3. *I. Organization and maintenance of village records.*—Of the questions at present engaging the attention of His Excellency in Council, one of the most important is that which relates to the reorganization of the Survey Department in consequence of the fact that initial survey operations have now been almost completed in this Presidency. The Board of Revenue has recently submitted detailed proposals on the subject drawn up in consultation with the Superintendent of Revenue Survey. The chief object of these proposals is to make adequate provision for the maintenance in the future of the land records which have already been prepared with the aid of the Survey Department. Pending the issue of orders on the Board's scheme, the maintenance of these records will continue to devolve partly upon the special staff detached from the regular establishment of the Survey Department for this purpose in 1894–95, which is working under the control of the Superintendent of Survey, and partly upon the Deputy Director of Land Records and Agriculture and the district Revenue officials, whose work is supervised by the Board of Revenue. The work of the special staff of Survey officers has been fully dealt with in the annual administration report of the Survey Department which has been reviewed at length by Government in separate proceedings. The only points which now require notice thus relate to the work of the Deputy Director, Mr. C. Benson, and of the Revenue officers generally throughout the Presidency. The Government notes with satisfaction that Mr. Benson has devoted a large portion of his time to the inspection of village and taluk accounts and that, in addition to performing substantial work in this direction and to advising the Board and Government on matters in regard to which his opinion as an agricultural expert was required, he has been able to formulate proposals for the revision of the existing forms of village and taluk accounts. Mr. Benson's inspections go to show that Divisional-officers, Tahsildars and Taluk Head Accountants should devote closer attention to the maintenance of these important accounts, but the Board has no doubt already issued instructions to Collectors on the subject and there is no necessity for Government to dwell further upon it.

4. *II. Analysis of districts.*—Considerable progress appears to have been made in the preparation and checking of the village statistical registers and firka books; but it is evident that this important work is still behind-hand in the majority of districts. It is however satisfactory to notice that this remark does not apply to the Ceded districts in which the subject of famine analysis is of special importance. Further comment on the matter will be deferred pending the receipt of the Board's Jamabandi report, but it may here be remarked that proposals have recently been made to the Government of India in view to the simplification of the somewhat cumbrous firka books at present in use and that orders have recently been issued directing the discontinuance of the annual reports hitherto submitted regarding the economic condition of the several districts. It has been decided that if one complete report of this description is available for each district, there is no necessity to require the submission of information of this character more frequently than once in every ten years provided that the District officers keep a careful watch for unusual fluctuations in the economic condition of their charges.

5. *III. Collection of Revenue in precarious tracts.*—Elasticity in the collection of land revenue was one of the subjects referred by the Government of India for discussion with Sir Edward Buck. The main conclusion arrived at by the conference and endorsed by His Excellency the Governor in Council was that in the Madras Presidency the remission rules embodied in the Board's Standing Order provide sufficiently for such relaxation in the demand as may from time to time be necessary in special tracts. The working of these rules during the year under review will be dealt with more fully in the Board's Jamabandi report and calls for no comment in this order.

6. *IV. Measures of protection.*—Paragraph 17 of the report which relates to the extension of railway communications describes the Nilgiri Railway as "81 miles" in length; "81" is presumably a printer's mistake for "18."

The progress made with the East Coast Railway and Rushikulya and Periyár Irrigation Works has been separately dealt with by the Public Works Department and the subject of advances to agriculturists will be reviewed when the Board's Jamabandi report is submitted.

7. *V. Agricultural experiments.*—Many of the matters referred to in this section of the report, *e.g.*, those mentioned in paragraphs 23, 24 and 32, have already been discussed in separate proceedings issued from time to time during the year, and such portions as relate to the working of the College of Agriculture have already come in a more detailed form before the Educational Department. But few comments are therefore necessary in these proceedings.

The general question of the future of agricultural education and experiment so far as this Presidency is concerned has been carefully considered by a Committee and the conclusions arrived at by Government in regard to the recommendations made by the Committee have been placed before the Government of India. Orders have also been issued directing the immediate establishment of one experimental farm either at Coimbatore or Bellary upon the success of which will depend the question whether similar institutions should be established in other parts of the Presidency.

It is satisfactory to note that the conduct of crop experiments by Revenue officers was such as to lead the Board to anticipate considerable improvement in the accuracy of the results of the next set of experiments.

The introduction of a superior pattern of plough in Kurnool should continue to engage the attention of the Board and the District officers.

The issue of orders on the question of resuscitating agricultural exhibitions in mufassal districts to which reference is made in paragraph 32 of the report has been held over pending the promulgation of the policy finally decided upon by the Government of India in regard to the extension of agricultural education.

The question of destroying prickly-pear growth by means of the cochineal insect is now under investigation by Dr. Bourne of the Presidency College.

8. *VI. Cattle-breeding and Veterinary establishment.*—The administration of the Civil Veterinary Department has already been separately reviewed by Government, but the Board's report contains further information on the subject of cattle disease and mortality. The year was marked by the discontinuance of the attempt to register the deaths of cattle from natural decay and accidents, while registration was entirely given up in the case of sheep and goats. This was decided upon in view of the great difficulty of obtaining reliable information and the fact that the reports compiled were so materially inaccurate as to be of little value.

9. *VII. Miscellaneous.*—As the Government of India has recently deputed Mr. Holland to assist Mr. Middlemiss, more rapid progress in the localization and examination of valuable mineral deposits may be expected in the future than has been possible in the past.

The variations of trade are scrutinized every quarter by the Director-General of Statistics to the Government of India and call for no criticism in these proceedings. The most striking feature of the year may however be noticed; namely, the enormous increase in the exports from the districts lying north of the Gódávari.

(True Extract.)

(Signed) G. STOKES,
Ag. Secretary to Government.

REPORT

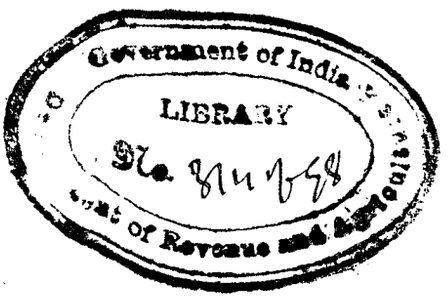
ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY

FOR THE OFFICIAL YEAR

1896-97.



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1898.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1896-97.

REPORT OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE FOR THE YEAR 1896-97.

Introductory.—The opening paragraph of the report on the operations of the Department of Land Records and Agriculture for 1895–96 set forth the recommendations of the two committees appointed to discuss the proposals of the Simla Conference of 1893 with regard to Agricultural Education and the utilization of Land Records, and Dr. Voelcker's report for the construction of a practical scheme of district analysis. The orders of Government on these recommendations are noted below.

2. The recommendations of the committee which sat to discuss the question of Agricultural Education were —

(1) That Agriculture should not appear as a separate subject in the curriculum of rural Primary schools, but that the effort should be to impart an elementary knowledge of it in the group "Object Lessons and Elementary Science," which group should be made a compulsory subject;

(2) that Agriculture should be recognized as a separate optional subject for boys after they have passed the Fourth Standard, and that, until properly qualified teachers become available, the study of a Text-book on Agriculture in Lower Secondary schools will be better than nothing;

(3) that the first necessary step is to provide for the training of the teachers of Lower Secondary and Primary rural schools, and that to this end every training institution, where such teachers are trained, should —

(*a*) have on its staff a master qualified to teach agriculture, and

(*b*) have attached to it a school-garden;

(4) that to secure an adequate supply of trained teachers for the rural Primary and Lower Secondary schools, an Agricultural class should be developed in selected educational institutions where the general education will be carried on up to the Upper Secondary Examination, and special education in Agriculture up to the Intermediate Standard. Such classes will need a small demonstrational farm for teaching purposes, and a portion of a Government Experimental farm may be utilized for the purpose, if there be one in the vicinity;

(5) that it is not otherwise expedient to combine a Farm-school for the above purpose, with an Experimental farm, as proposed in the scheme of the Madras Government;

(6) that the early establishment of Experimental farms, as separate organizations and designed for carrying on agricultural investigation, is advisable.

The first two recommendations were accepted by Government, but while approving of the principle of the third and fourth recommendations, Government expressed the opinion that the object in view is practically unattainable. The fifth recommendation as to the inexpediency of combining a Farm-school with an Experimental farm for teaching purposes has also been accepted, except in so far as it may be found possible to utilize a portion of such farm for the demonstration of agricultural methods and practices required for the practical instruction of such agricultural classes, as may ultimately be started in connection with normal schools. The sixth recommendation did not commend itself to Government, unless the experience gained by the management of a single Experimental farm should prove the probability of the successful establishment of additional institutions of a like nature.

3. The recommendations of the committee appointed to discuss the methods of utilizing Land Records and Dr. Voelcker's report for the purpose of constructing a practical scheme of district analysis were —

(1) That in Madras adequate provision has been made for the timely reporting of sudden calamities;

(2) that as regards any serious gradual deterioration, or decline, in a village or tract, the annual ryotwari settlement ensures its being brought to the notice of the jamabandi officer.

(3) that a vigilant and intelligent scrutiny of the village registers by the jamabandi officer, with a view to discovering the cause of any remarkable fluctuations, should continue to be insisted on;

(4) that to provide an account whereby the decline, or progress, of a village can be seen at a glance, it is desirable to compress into one page the more important of the voluminous statistics now embodied in the Revenue Inspector's firka book; and that if this is done the firka book, in its present shape, may be dispensed with;

(5) that it answers no useful purpose to require of Collectors an annual report on the economic condition of their districts as disclosed by a scrutiny of the Land Records, and that in the absence of extraordinary change, such a report cannot be usefully submitted oftener than once in ten years;

(6) that the statistical atlas, now in course of publication, will exhibit a sufficient analysis of each district, in respect of the great agricultural defect, "deficiency of rainfall and absence of irrigation;"

(7) that defects in irrigation, and in the supply of wood and fuel are being adequately investigated by the Revenue, Public Works and Forest Departments;

(8) that a list of the other principal agricultural defects should be drawn up, and that these should be gradually investigated in the order of their importance;

(9) that Experimental farms are necessary for the ascertainment by agricultural experts of how far defects in agricultural practice are remediable; and that, in Madras, action in this direction is more pressing than in the direction of improving Land Records;

(10) that in view of the extreme importance of securing continuity of expert supervision, in the event of Experimental farms being started, immediate steps should be taken to secure the services of a second agricultural expert to provide for the contingency of Mr. Benson taking furlough, or retiring;

(11) that if, and when, Mr. Benson leaves the service, the original plan of appointing a Civilian Deputy Director of Land Records may be revived;

(12) that, meanwhile, as Mr. Benson has now devoted a year to the study of village and taluk accounts, it is best to leave him in charge of the office of Deputy Director of Land Records without prejudice to his supervising any agricultural work which may be undertaken;

(13) that with reference to the scheme laid before the Government of India for a permanent staff for the maintenance of Survey Records, and training of karnams (*vide* G.O., No. 635, Revenue, dated 17th September 1895), it should be considered whether the strength of the establishment may not be gradually increased, as vacancies occur in the posts allotted to eight European officers, by replacing them, at the same cost, by twelve native Deputy Collectors.

One superior officer would then be available for every two districts and with this increase in numbers it would be possible for them to assist in the supervision of the taluk and village accounts;

(14) that, meanwhile, the Board's proposal for the appointment of three officers of the grade of Deputy Collector to assist in inspecting taluk and village accounts (*vide* B.P., No. 348, R.S., L.R. and Agri., dated 1st November 1895) may be approved;

(15) that after the Deputy Director, or one of the proposed Assistant Directors, has inspected the Land Records of a district, he should submit his report, not to the Board as hitherto, but to the Collector of the district, the Board to be referred to only when a specific general ruling is called for;

(16) that the Collector should devote a paragraph in his jamabandi report to stating the results of the inspection, and the action taken by him thereupon.

The first eight recommendations were accepted by Government. The ninth recommendation was accepted, subject to the limitation that only one Experimental farm should be established until the success of the experiment is assured. With

regard to the tenth, eleventh and twelfth recommendations Government considered that it was unnecessary to entertain a second agricultural expert for the purpose specified, that the retention of a Deputy Director of Land Records was a matter of doubtful expediency, but one which would be considered with the proposals for the re-organization of the Survey Department and the Board of Revenue, and that, as the experiment of establishing a Government farm or Government farms would fully occupy the time of the present agricultural expert it would be impossible for him to remain in charge of the office of the Deputy Director of Land Records. The thirteenth and fourteenth proposals were negatived, while the fifteenth and sixteenth were approved, conditionally upon the retention of the office of the Deputy Director of Land Records.

4. The form of report herein adopted follows the model of previous years. With reference to paragraph 14 (iii) of G.O., Mis. No. 487, Rev. dated 24th September 1896, the Director hopes to submit his proposals for amending the form of the report at an early date.

The instructions on the subject which Sir E. Buck led the Board to expect have not been received.

I.—ORGANIZATION AND MAINTENANCE OF VILLAGE RECORDS.

5. *Land Records.*—Proposals were submitted by the Deputy Director to the Board in the Land Revenue Department for the improvement of taluk manual accounts Nos. 4 to 7 and regarding the distribution of collections between land revenue and cesses. During the latter part of June and the whole of July the taluk accounts of three taluks in Gódávari district, as well as the village accounts of a few selected villages in each taluk, were inspected and reported on. In August, two taluks of South Arcot district were visited and similar inspections were made and reported on. Early in September the Deputy Director was at head-quarters and was chiefly engaged on miscellaneous duties not belonging to the Land Records branch, and also in preparing the report on the inspected taluks. During October, two taluks in Tanjore district were visited and the taluk accounts, including the village accounts of a few villages, were inspected and reported on. In November, the Deputy Director returned to head-quarters and was thereafter engaged chiefly in famine work, until his departure to England on furlough under medical certificate in March 1897.

6. *Training of Karnams.*—In accordance with the scheme of holding annual survey schools, introduced in the preceding year, such schools were held during 1896–97 in 127 out of 156 taluks in the Presidency. The number of men instructed at these schools was 12,913, of whom 6,688 or about 52 per cent. were found, on examination, to possess good or fair knowledge. The taluks in which no schools were held are noted in the margin. No schools were held in the first-mentioned eighteen taluks owing to the unfavourable season which rendered it necessary to keep karnams in their villages at the time when the schools should have been held. In Trichinopoly, the karnams in all taluks were engaged during a portion of the year in the measurement of sub-divisions of survey fields and in the preparation of field measurement books. It was therefore considered inexpedient to hold survey schools for their instruction. In four out of the five taluks in Salem, karnams were employed on re-survey work and no schools were therefore held. In the remaining taluk—Dharmapuri—a school was opened on the 23rd October but had to be closed after a few days owing to the prevalence of cholera.

Districts.	Taluks.
Ganjám	1. Berhampur. 2. Gumsur.
Anantapur	3. Anantapur. 4. Hindúpur. 5. Dharmavaram. 6. Penukonda.
Bellary	7. Rayadrug. 8. Bellary. 9. Adóni.
Kurnool	10. Pattikonda.
Cuddapah	11. Proddatur. 12. Pulivendla. 13. Badvel.
North Arcot	14. Wallajapet.
Nellore	15. Nellore. 16. Kanigiri.
Chingleput	17. Chingleput. 18. Tiruvallúr.
Salem	19. Atur. 20. Námakkal. 21. Tiruchengódu. 22. Salem. 23. Uttangarai. 24. Dharmapuri.
Trichinopoly	All taluks (5).

7. *Training of Revenue Inspectors.*—The total number of Revenue Inspectors in the Presidency during the year was 633. Of these 601 appointments were held by men who had undergone training in survey. Two had been exempted from passing the

test, and two more continued to draw the old scale of pay. The remaining appointments were held by acting men untrained in survey. Details are given below :—

Districts.	Number sanctioned.	Number		Remarks.
		Trained in survey.	Not trained.	
Ganjám	12	12	..	
Vizagapatam	9	9	..	
Gódávari	48	47	1	Vacant.
Kistna	48	47	1	
Nellore	32	32	..	
Bellary	28	26	2	Draw pay at the old rate.
Kurnool	30	27	3	
Anantapur	24	22	2	
Cuddapah	41	41	..	
Chingleput	22	22	..	
Madras	3	3	..	
North Arcot	38	38	..	
South Arcot	41	41	..	
Tanjore	37	33	4	
Trichinopoly	24	23	1	
Madura	30	28	2	
Tinnevelly	36	32	4	
Salem	35	32	* 3	
Coimbatore	38	38	..	
Nilgiris	6	4	2	
Malabar	34	31	3	
South Canara	17	13	4	
Total ..	633	601	32	

* Two old school men.

8. *Re-surveys.*—Re-survey was commenced during the year in the taluks of Guntúr and Nandigáma in the Kistna district and in Ramallakot and Nandikotkur in the Kurnool district. The area re-surveyed amounted to 780 square miles in the former district and 294 square miles in the latter. The work in the latter district was delayed by the prevalence of famine which rendered it impossible to spare karnams for the work, except in a few villages.

II.—ANALYSIS OF DISTRICTS.

9. *Statistical Registers.*—So far as information is available, the village statistical registers and the firka books have been written up and checked in Ganjám, Vizagapatam, Gódávari, Bellary, Anantapur, Cuddapah, Coimbatore, Trichinopoly, Tanjore and Nilgiris up to fasli 1304. In South Arcot and Madura, the work is in arrears as regards 19 and 194 villages respectively, while Tinnevelly has almost completed the work, there remaining only 5 villages for which village registers and firka books are to be prepared and 13 villages for which they are to be checked. As regards the work done in this direction during fasli 1305 (1895–96) it would appear that the posting and checking have been completed in the Gódávari, Bellary, Anantapur, Salem and Tanjore districts, and nearly so in Ganjám, Vizagapatam, Kistna, Nellore and Coimbatore. Particulars of progress are shown in the table given below :—

Districts.	Number of Villages (Government and Inam).				
	In the district.	For which village registers have been		For which firka books have been	
		Prepared.	Checked.	Prepared.	Checked.
Ganjám	1,531	1,531	1,195	1,531	1,527
Vizagapatam	294	270	270	293	293
Gódávari	1,449	Complete.		Complete.	
Kistna	1,368	1,356	1,354	1,354	1,352
Kurnool	789	766	668	703	578
Bellary	962	Complete.		Complete.	
Anantapur	1,002				
Cuddapah	1,354	1,293	1,293	1,255	1,187
Nellore	931	907	907	Complete.	
Chingleput	1,782	1,739	1,465	1,695	1,695
South Arcot	2,699	2,671	2,652	2,448	2,095
North Arcot	1,767	1,767	1,583	1,767	1,583
Salem	3,081	Complete.		Complete.	
Coimbatore	1,508	1,481	1,481	1,483	1,183
Trichinopoly	730	719	719	717	717
Tanjore	2,541	Complete.		Complete.	
Madura	937	690	597	632	459
Tinnevelly	1,099	1,052	1,010	766	724
Nilgiris	48	36	17	48	29

10. A report on the economic condition of the district as disclosed by the examination of village registers and firka books for fasli 1303 was received during the year from Salem, the only district from which no similar report had been previously submitted. It was reviewed and submitted to Government in due course. The Government agreeing with the views of the local conference of December 1895 has ordered that the reports on the economic condition of districts be decennial instead of annual as hitherto, and instructions have accordingly been issued to all Collectors requiring them to make such arrangements as will ensure the submission of the report to the Board before the close of the next census year (1901) embodying in the same all the information necessary for the revision, up to the close of the preceding fasli year, of the district memoirs published in the statistical atlas of the Presidency. Revised sheets of firka books were issued during the year agreeably to the proposals of the conference, which were approved by Government. Collectors have been requested to have the entries in them posted from fasli 1301 and to submit progress reports once in six months until all arrears have been cleared up.

III.—COLLECTION OF REVENUE IN PRECARIOUS TRACTS.

11. Owing to serious failure of rains, parts of the Deccan districts—Kurnool, Cuddapah, Anantapur and Bellary—and of Ganjám and Vizagapatam in the north suffered extensive loss of crop. Besides the remissions granted under the usual rules on *wet* lands, the assessment on *dry* lands was remitted to a large extent in the distressed portions of the Deccan districts; and the collection of the remaining demand was also postponed. In Ganjám, remission on "dry" lands was granted only in respect of certain areas cultivated with rain-fed paddy, the crop on which was lost. In Vizagapatam no remission of dry assessment was deemed necessary.

In Anantapur, which is one of the districts most liable to famine, the kistbandi, or scheme of instalments for paying Government revenue, was altered during the year, the first instalment being postponed from December to February.

IV.—MEASURES OF PROTECTION AND RELIEF.

12. *Season and Rainfall.*—The season was generally favourable for agricultural operations, except in the Deccan districts and in parts of Ganjám, Vizagapatam, North Arcot and Salem. In the Nilgiris, the season was unfavourable to coffee, tea and ordinary native crops.

The average rainfall for the Presidency was 47·54 inches against 49·62 inches registered in 1895–96 and 44·80 inches, the average of 25 years ending with 1894–95.

The average rainfall from April to September (south-west monsoon) amounted to 29·37 inches against 32·77 inches in the previous year, and was about an inch more than the normal. The falls were, however, very unevenly distributed. In the West Coast districts and on the Nilgiris the rainfall was from 20 to 25 inches in excess of the average, while in most of the other districts there was considerable deficiency. The monsoon set in fairly well, and, from June to August, the rains were, on the whole, nearly up to the average, except in the Carnatic districts (excluding Nellore) and North Arcot, Salem and Trichinopoly. The fall in September proved scanty in the Circars and in the Deccan districts and was light in the Carnatic, while in the remaining districts it was good and was followed by copious rain in October. At the close of the south-west monsoon period, the state of the season gave cause for anxiety in respect of the Deccan districts, parts of the Circars, the Carnatic and the Central districts and parts of North Arcot. The north-east monsoon commenced late, but the rainfall was copious over the whole of the southern half of the Presidency. The average for the Presidency from October to March was 18·17 inches or 1·32 inches more than in the previous year and 1·75 inches more than the normal fall. All anxiety was then removed as regards the Carnatic and the Central districts, the Kistna and the greater portion of the Gódávari district. The tracts which continued to give anxiety at the close of the north-east monsoon were Ganjám and parts of the Vizagapatam littoral, some of the upland portions of Gódávari, especially the Agency tracts, that portion of the Deccan districts which lies to the west of the Eastern Ghauts and a small portion of North Arcot.

The prices of food-grains, which have been steadily falling since the famine of 1891–92, rose very considerably during the year under report. The rise was due

partly to the season having proved unfavourable in Ganjám, Vizagapatam and the Deccan districts and partly to the large exports of grain northwards to Bombay and Central Provinces as well as to Ceylon. Until June, the prices were normal; a slight rise was perceptible in July, August and September but nowhere was the rise serious. During the latter half of September, however, the upward tendency of prices became more pronounced, and in October and November the rise became rapid almost throughout the Presidency. The showers of November and December and the harvests that followed brought down the prices for a time, but towards the close of the year the upward tendency had again begun to manifest itself. At the end of March, the prices of staple food-grains were higher than the "scarcity" rates in the Deccan districts and higher than the "warning" rates in all other districts except South Arcot, Trichinopoly, Tanjore, Madura, Tinnevelly, South Canara and the Nilgiris.

The deficient rainfall and consequent extensive local failure of crop, coupled with the excessive rise in prices, stimulated by the existence of scarcity in other parts of India, gave rise to great distress among the labouring classes, and State relief had to be provided for them. Test works opened in the Deccan districts in November having attracted large numbers, ordinary relief works were started from time to time as the area of distress extended. The affected tracts which, at the end of November, covered an area of 8,495 square miles with a population of 1,206,000, comprised, at the end of the official year, an area of 15,988 square miles with a population of 3,271,000, and embraced roughly speaking, the taluks occupying the north-western part of Cuddapah, and the northern half of Anantapur, the taluks of Kurnool immediately adjoining the above, the eastern and northern taluks of Bellary and portions of Ganjám and Vizagapatam littoral. Relief works were started in Ganjám in February and in Vizagapatam about the middle of March.

The measures of relief which were in operation at the close of the year were—

(1) relief on works;

(2) gratuitous relief by the distribution of cooked food in kitchens, and by the grant of money doles (in Ganjám only);

(3) relief of weavers at their own trade;

(4) grant of advances under the Land Improvement and the Agriculturists' Loans Acts; and

(5) suspension of land revenue.

The numbers relieved at the end of the year were—

(*a*) On works, 86,385.
(*b*) Gratuitously, 5,858.
(*c*) Weavers, 8,806.

13. *Extension of Communications.*—The East Coast Railway has been opened for public traffic from Bezwada to Cuttack road, a length of 498·94 miles, with a branch line from Kurda road to Puri (25·34 miles), thus making a total length of 524·28 miles. Work on the Nilgiri Railway (16·81 miles) was resumed in April 1896 and good progress was made during the year. The Ennur-Bezwada section of the Bezwada-Madras Railway (254½ miles) is in good progress, and a portion from Bezwada to Bápatla (40 miles) is almost finished, and ready for opening. The Peralam-Karikal Railway (14·45 miles) is under construction by the South Indian Railway on behalf of the French Government. The Arsikere-Mangalore Railway Survey has been completed and the plans and estimates have been forwarded to the Government of India.

14. *Irrigation.*—An expenditure of Rs. 2·04 lakhs was incurred during the year on the Rushikulya project in the Ganjám district. The Suradá reservoir nearly approached completion, while its head sluice and channel therefrom to the Johoro river, as well as several distributaries, were fully completed. The total outlay on the project up to the end of the year was Rs. 41·11 lakhs. The outlay on improvements to the Kistna delta system during the year was Rs. 5·84 lakhs, and to the end of the year Rs. 119·61 lakhs. The new head sluice at Sítanagaram, which was commenced in the preceding year to replace the existing head sluice, was brought up to platform level during the year. Investigations for the proper distribution of flood water and of water for irrigation in the Cauvery delta system were prosecuted during the year, and estimates, aggregating Rs. 7·86 lakhs, for improvements to the Upper Coleroon

anikat, and for fitting lift shutters to the grand anikat, were prepared. Rs. 0·42 lakhs were expended on works connected with the improvements to the system. The net outlay on the Periyár project in the Madura district during the year was Rs. 0·44 lakhs, after deducting a recovery of expenditure on tools and plant of Rs. 0·86 lakhs. Up to the end of the year, 36 miles of main canals and 50 miles of branch channels were completed, and a considerable number of distributaries were completed or in progress.

The minor irrigation works under the charge of the Revenue department number over 30,000, having an irrigable area of about 1½ million acres. The amount sanctioned for their repairs during the year was Rs. 4·74 lakhs, out of which 4·29 lakhs were actually expended.

15. *Advances to Agriculturists.*—The loans granted during the year under report under the Land Improvement and Agriculturists' Loans Acts, amounted to Rupees 5,52,607 against Rs. 2,03,472 advanced in the previous year. The large increase, as compared with the preceding three years, was due to the unfavourable character of the season during the latter part of the year in Ganjám, Vizagapatam, Cuddapah, Kurnool, Bellary and Anantapur. Out of the 7½ lakhs of rupees sanctioned for the year, 5 lakhs were specially allotted for the Madura district in view to afford facilities for the reclamation of waste lands commanded by the Periyár project; but the amount actually advanced on this account was only Rs. 45,361. More than 48 per cent. of the total amount was advanced in the Deccan districts and 18 per cent. in the North Arcot and South Arcot districts, as shown in the margin.

Deccan Districts.	RS.	A.	P.
Kurnool	31,807	8	0
Bellary	1,10,738	5	10
Anantapur	1,17,535	0	0
Cuddapah	5,376	9	2
Total ...	2,65,457	7	0
North Arcot	78,336	1	6
South Arcot	21,784	0	0
Total ...	1,00,120	1	6

The following statement shows the amounts advanced under the Land Improvement and Agriculturists' Loans Acts during the past five years :—

Years.	Budget allotment under both Acts.	Advances made under		Total advances.
		The Land Improvement Loans Act.	The Agriculturists' Loans Act.	
	RS.	RS.	RS.	RS.
1892-93	23,00,000	20,41,809	2,33,350	22,75,159
1893-94	10,00,000	4,40,312	10,609	4,50,921
1894-95	7,00,000	2,63,709	15,882	2,79,591
1895-96	3,00,000	1,91,521	11,951	2,03,472
1896-97	7,50,000	5,04,454	48,153	5,52 607

V.—AGRICULTURAL EDUCATION AND EXPERIMENTS.

16. *Agricultural Education.*—The work of the College of Agriculture at Saidapet has been separately reviewed, and, with the exception of certain crop and dairy experiments of general interest, calls for no further notice in this report. With a view to popularize the institution, Government has again urged all Collectors to do their best to provide employment for passed students of the College. The Principal of the College has reported that the result of his circulation among the Collectors and District officers of a statement showing the names of passed students seeking employment was satisfactory.

17. The College farm continued during the year under report to be worked chiefly for the edification of the students. The Principal gives the following interesting account of the results of the year's cultivation, and of the yield of milk given by the farm cows :—

(1) "The paddy is divided into seven classes according to method of cultivation and to the fact whether it was damaged or not by flood. It will be observed that the students must have seen paddy cultivated in a variety of ways. The paddy which

was drilled and which escaped damage by flood yielded 3,712 lb. per acre of grain and 3,360 lb. of straw. The yield of grain must be considered *excellent*. The land on which this crop was grown may be said to be the best soil on the farm, but it is far inferior to soils in the Tanjore district from which a yield of 3,000 lb. would be considered very good. The paddy which was transplanted and which also escaped damage by flood may also be said to have yielded excellently (2,203 lb. per acre) when the nature of the soil is considered. The paddy which was transplanted but which was damaged by flood had its yield of grain decreased by about 300 lb. and its yield of straw increased by about 600 lb. The paddy sown broadcast dry on very poor soil yielded well (1,141 lb. per acre). Great damage was done by flood to the paddy growing on 8 acres of land, the crop having been submerged for days under running water. Of course, the yield was very considerably decreased.

(2) "The ragi transplanted and grown under irrigation yielded very well—grain per acre 960 lb.; straw per acre 4,633 lb. That drilled and grown as a dry crop was very much damaged by heavy rain and yielded badly in consequence. The varagu (sown with dholl) did fairly well.

(3) "The pulse crops were seriously damaged by the heavy rains of November and December—the green-gram was practically destroyed.

(4) "Among the industrial crops, See Island cotton deserves to be specially mentioned. The yield per acre was 1,200 lb. of cotton in seed (360 lb. lint and 840 lb. seed). The average yield in this Presidency on the so-called black cotton soil is 50 lb. to 70 lb. lint and 150 lb. to 200 lb. seed. The Sea Island cotton as a good staple and the lint is easily separated from the seed. There appears to be no difficulty about its cultivation. The only disadvantage it possesses is the height of the plant which necessitates a crooked stick being used in gathering the higher bolls. The farm on sandy soil obtained a yield about six times as large as that raised on black cotton soil. It would be interesting if really efficient experiments were to be conducted with the farm seed in the districts where black cotton soil is found. The sugarcane was submerged for some days and very much damaged in consequence. The ground-nut shown as harvested in this report was put down in August 1895. One-third of the crop was given for harvesting and 640 lb. per acre represents therefore two-thirds of the total produce. The yield must be considered poor.

(5) "Among sundry crops, plantains did fairly well in spite of an unfavourable season. The fruit and leaves from half an acre fetched over Rs. 30. The vegetables were much damaged by heavy rain and in some cases completely destroyed. In an ordinary season the cultivation of vegetables is very profitable and were the farm worked for profit it would be desirable to largely increase the area under vegetables. They respond well to careful cultivation and there is no difficulty about their disposal.

Crops.	Area sown.	Outturn.				Remark.
		Grain or seed.		Straw or fodder.		
		Amount.	Per acre.	Amount.	Per acre.	
Cereals.	ACS.	LB.	LB.	LB.	LB.	
Paddy transplanted (not damaged by flood).	3·50	7·710·5	2,203	8,800	2,514	
Paddy transplanted (damaged by flood).	1·60	3,026	1,891	5,040	3,150	
Paddy sown broadcast, wet system (damaged by heavy rain).	1·00	1,031	1,031	2,400	2,400	Inferior variety sown, so slightly saltish.
Paddy drilled (not damaged by flood).	3·00	11,136	3,712	10,080	3,360	
Paddy drilled (damaged by flood) ..	5·25	6,233	1,188	15,680	2,987	
Paddy drilled, inferior variety in sandy soil.	3·00	1,513	504	5,040	1,680	
Paddy broadcast, dry, sandy soil ..	3·30	3,766	1,141	7,840	2,376	
Ragi drilled, dry crop	2·50	598	239	3,360	1,344	Crop while young suffered severely from excessive rain.
Ragi transplanted and under irrigation.	4·77	4,580	960	22,101	4,633	
Varagu (sown with dholl)	3·50	2,170	620	5,888	1,682	Dholl standing.

Crops.	Area sown.	Outturn.				Remarks.
		Grain or seed.		Straw or fodder.		
		Amount.	Per acre.	Amount.	Per acre.	
Pulses.	ACS.	LB.	LB.	LB.	LB.	
Black gram	2·75	1,190	433	..	..	Crop suffered while in flower owing to continuous heavy rain.
Green gram	1·90	140	74	..	..	Do. do.
Dholl (sown with varagu).	6·20	1,170	189	..	..	Varagu harvested last year and shown in last year's report.
Industrial.						
Sugarcane	1·00	Sold by auction for Rs. 152-8-0.				Crop submerged during the heavy rains of November and December, and much damaged. Over quarter of an acre reserved for seed and still standing.
Ground-nut (not yet harvested).	3·30	..	..	5,376 (haulms).	1,629 (haulms).	....
Ground-nut (harvested).	1·00	640	640	..	..	Haulms shown in last year's report.
Sea Island cotton ..	·10	120 lb. cotton in seed.	1,200 lb. cotton in seed.	..	..	....
Sundries.						
Plantains	·50	1,500 (fruit).	3,000 (fruit).	Leaves worth Rs. 8.	Leaves worth Rs. 16.	Crop still standing, green plantain sold at 3 pies a pound.
Chillies	·15	Dry chillies worth Rupees 10.	Dry chillies worth Rupees 66-10-8.	..	..	....
Do.	·25	..	..	..	..	Crop standing.
English and Indian vegetables.	2·00	Vegetables worth Rupees 83-6-0.	Vegetables worth Rupees 41-11-0.	...	..	Vegetables very much damaged by heavy and incessant rain.
Green fodder.						
Cholam	23·45	..	..	1,17,855	5,026	One cutting only, damaged by heavy rain.
Horse gram	11·55	..	..	21,212	1,836·5	Sown late owing to heavy rain, crop standing in ·75 acre.
Guinea grass	2·00	..	..	7,411	3,705·5	....
Lucerne	·10	..	..	275	2,750	From one cutting only crop still standing.
Green manure.						
Sunn hemp	1·60	..	..	..	..	Ploughed in.
Horse gram						
Indigo						
Dholl	1·90	..	..	..	..	Ploughed in.

(6) "Eleven cows yielded milk during the year against twelve during the previous year. Meenachi I (16 years old) was sold on account of age. The yield of milk increased by 1,929 lb. (517 Madras measures). Tara (No. 2), the second best milker on the farm, slipped her calf, and milked without a calf at foot for 346 days. Her yield in consequence was much reduced.

(7) "Although the number of cows was decreased by one and the yield of milk was increased by 1,929 lb., the average yield, as worked out in previous report, decreased to 8·15 lb. This furnishes another proof of the inutility of the averages arrived at by the method adopted above, in disapproval of which I have several times expressed myself. The 'average for the herd' is best obtained, I think, by dividing the total yield by 11 (the number of cows) × 365. By this process the average works out as 5·97 lb. I do not think it practicable to give effect to the suggestion made in paragraph 2 of B.P., No. 6035, dated 27th November 1896. In any case, I consider too much has been made of the 'average yield.' In practice, a herd would be judged on various grounds and the 'average yield' during any given year would not be reckoned of much, if any, consequence.

(8) "The income from the sale of milk, butter, &c., decreased by Rs. 120. The explanation of this is as follows:—1st, during the year under report the farm did not maintain any buffaloes. Two buffaloes were kept during the previous year. They

yielded 465 measures of milk, which realized Rs. 87. These animals were most troublesome and it was not worth while to employ a separate man to look after them. I consequently decided not to keep any buffaloes during 1896–97. 2nd, in May 1895, the prices of milk, butter and curd were kept at the following rates:—As. 3–6 per measure, As. 12 per pound, As. 1–6 per measure, respectively. In May 1896, it was not practicable to maintain these rates and they were consequently reduced to As. 2–8 per measure of milk, As. 8 per pound of butter and Anna 1 per measure of curd. 3rd, in 1895–96, all sums due for milk, butter, &c., were recovered during the year, but in 1896–97 Rs. 92–2–10 stood over as balance. I may add that the whole of this sum will be recovered before 1st July next, except Rs. 8–11–10, about which, I fear, there will have to be legal proceedings.

(9) "The following statement gives the yield of milk. All the cows are pure bred Nellores, with the exception of Kali II, which is a cross between Nellore and Mysore:—

STATEMENT showing the yield of milk in the College Farm herd during 1896–97.

No.	Name of cow.	Age of cow.	Yield in 1896–97.		Number of days cow yielded.	Average per day in	
			Madras measures of 100 cubic inches.	Pounds.		Madras measures.	Pounds.
		YEARS.					
1	Kalyani I *	13	1,086·125	4,051·246	326	3·332	12·428
2	Tára *	8	526·375	1,963·379	346	1·521	5·673
3	Kalyani III *	7	464·125	1,731·186	224	2·072	7·729
4	Parvati *	6	400·625	1,494·331	220	1·821	6·792
5	Alamelu *	6	556·250	2,074·813	344	1·617	6·031
6	Narayani *	9	880·375	3,283·799	363	2·425	9·045
7	Seetha *	7	284·500	1,061·185	144	1·975	7·367
8	Meenachi II *	8	562·125	2,096·726	238	2·362	8·810
9	Do. I *	16		Sold.			
10	Sahib's cow *	13	838·625	3,128·071	364	2·304	8·594
11	Kali II †	12	722·125	2,693·526	304	2·375	8·859
12	Govindu *	9	102·375	381·859	66	1·55	5·785
	Total ..		6,423·625	23,960·121	2,939	..	..

* Nellore. † Cross bred, Nellore and Mysore.

(10) "In paragraph 8 of your Proceedings, No. 10116, of 14th September 1896, you desired certain calculations to be made, so that 'the public may form some idea as to the amount of net income that can be derived from a well-nourished cow of good breed.' With this object in view I shall work out the actual expenses of, and the actual income from, the best milker on the farm and also from one of the medium milkers for last financial year. In both cases, the whole milking period fell within the financial year.

(11) "*Kalyani I.*—This animal milked for 326 days and yielded 1,086 Madras measures. While milking her daily feed was as follows:—4 lb. cake, 4 lb. dholl husk, 2 lb. wheat bran, 2 oz. salt, 20 lb. paddy-straw (or its equivalent). During her milking period of 326 days, she therefore consumed 1,304 lb. cake, 1,304 lb. dholl husk, 652 lb. wheat bran, $40\frac{3}{4}$ lb. salt, 6,520 lb. straw. When dry she got only 15 lb. straw and in 39 days consumed 585 lb.

"Her total cost of feeding was, therefore,—

	Rs.	A.	P.
1,304 lb. cake, at Rs. 12–12–0 per 500 lb.	33	4	0
1,304 lb. dholl husk, at 40 lb. per rupee	32	9	7
652 lb. of wheat bran, at 30 lb. per rupee	21	11	9
$40\frac{3}{4}$ lb. salt = $13\frac{1}{12}$ measures, at As. 2 per measure	1	11	2
6,520 lb. straw, at Rs. 10–8–0 a ton	30	9	0
585 lb. straw, at Rs. 10–8–0 a ton	2	11	11
Total ...	122	9	5

"Attendance may be estimated at Re. 1 a month, that is, Rs. 12 a year. Roughly speaking, the cost of maintaining such a cow may be put down as Rs. 135. Her produce for the year was as follows:—

	Rs.	A.	P.
1,086 measures of milk, at As. 3–6 a measure	237	9	0
Value of 4 tons of manure	12	0	0
Value of calf	15	0	0
Total ...	264	9	0

The profit, excluding depreciation, is, therefore, about Rs. 130.

(12) "*Kali II.*—This animal gave 722 measures of milk in 304 days. During this period she received a daily ration of 3 lb. cake, 3 lb. dholl husk, 2 lb. wheat bran, 2 oz. salt and 20 lb. paddy straw, or its equivalent. During the 61 days she was dry she received 15 lb. straw a day. A similar calculation as that made for Kalyani I gives the total cost of maintaining Kali II as follows :—

	Rs.	A.	P.
912 lb. cake (3 × 304), at Rs. 12–12–0 per 500 lb.	23	4	1
912 lb. dholl husk (3 × 304), at 40 lb. per rupee	22	12	10
608 lb. wheat bran (2 × 304), at 30 lb. per rupee	20	4	3
38 lb. salt = 12⅔ measures, at As. 2 a measure	1	9	4
6,080 lb. straw (20 × 304), at Rs. 10–8–0 a ton	28	8	0
915 lb. straw (15 × 61), at Rs. 10–8–0 a ton	4	4	8
Total ...	100	11	2
Add attendance ...	12	0	0
Grand Total ...	112	11	2

"Her *produce* was as follows :—

	Rs.	A.	P.
722 measures of milk, at As. 3-6 per measure	157	15	0
Value of 4 tons manure	12	0	0
Value of calf	12	0	0
Total ...	181	15	0

The profit, excluding depreciation, is therefore, about Rs. 69.

(13) "I have assumed that all the milk was sold for As. 3–6 a measure. No doubt were the farm a private venture and were therefore able to take certain steps to dispose of its produce, *all* the milk could be sold at the price mentioned. The farm during all months of the year, except May and June, sells its milk at As. 3–6 a measure to customers, who are not students of the College, and at As. 3 a measure to students of the College; during May and June the price is usually As. 2–8 a measure. As regards butter, the price varies on the farm from As. 8 to Rs. 1–8–0 a pound.

(14) "No doubt a private firm, producing a fairly large quantity of good butter, could obtain Re. 1 or As. 14 for a pound all the year through. It requires from five to six measures of farm milk to make a pound of butter."

18. As noted in the opening paragraphs, Government has determined that only one Experimental farm should be started at first deferring any extension of the scheme till the success of the preliminary venture is assured. Owing to famine work, and the departure on furlough of its only agricultural expert, the Board is obliged to allow the opening of the farm to stand over for the present.

19. *New Crops.*—No further experiments were made with Cape oats and barley, the climate of Ootacamund having shown itself unsuitable for both the crops. The Collectors of the Nilgiris and Madura were supplied with Seoni pissi and wheat in October last, but no reports of the results of the cultivation of the seeds have been received from them.

Fresh supplies of Sida seeds were forwarded to the Principal of the Agricultural College towards the close of the year with a request that he would make further experiments. No report on the subject was received within the year.

20. *Bulletins.*—The following bulletins were issued during the year:—

No. 33.—On the use of iron ploughs in the Ceded districts.

No. 34.—Tamil sayings and proverbs on agriculture.

21. *Outturn Experiments by Revenue officers.*—The results of the experiments conducted during the year by the Divisional officers and Tahsildars are as far as ever from furnishing any trustworthy data from which an average yield per acre can be calculated, or the correctness of the settlement estimates of outturn can be gauged. The Board has recently submitted its quinquennial report on these experiments, with its views thereon—*vide* B.P., No. 633, dated 23rd September 1897.

22. *Agricultural Implements and Machines.*—No demonstrations of any kind were conducted during the year as the Agricultural Inspectors and the Sub-Assistant Director were engaged in investigating the different varieties of cholam, cotton and indigo grown in Coimbatore, Madura, Trichinopoly and the Ceded districts and the various methods of cultivation. The Inspectors were not, however, able to complete the enquiry as they were called away for famine duty in the Deccan districts.

23. *Water-lifts.*—Further experiments were sanctioned, but were not carried out owing to the Deputy Director being employed on famine duty. Some useful experiments were conducted by Mr. Chatterton, Professor in the College of Engineering, and, after the close of the year, his conclusions were issued in the form of a bulletin with a brief preface by Mr. Benson.

24. *The Madras Agri-Horticultural Society.*—The total income of the Society amounted to Rs. 10,637, of which Rs. 4,000 was contributed by Government and Rs. 1,842 by subscriptions. The sale of seeds and plants also contributed to a certain extent to the income. During the year the number of members rose from 78 to 79. The annual show of flowers, fruit and vegetables was held on the 29th February 1896 and was, as usual, a great success. The library of the Society was strengthened by gifts and purchase, and many new plants were added to the gardens. The usual system of exchanging seeds and plants was continued.

25. *Collections for the Imperial Institute.*—The requisitions of the Reporter on Economic Products for a variety of specimens of plants, seeds, oils, fibres, &c., were complied with to the best of the Board's ability.

VI.—CATTLE-BREEDING AND THE CIVIL VETERINARY DEPARTMENT.

26. *The Civil Veterinary Department.*—During the year under review, Veterinary-Lieutenant A. E. Clarke continued to be Superintendent of the Civil Veterinary Department till the 22nd April 1897, when he reverted to military service, and was succeeded by Veterinary-Lieutenant Edwards. Mr. Clarke spent 135 days on tour and 179 at head-quarters. Out of the latter period, he devoted 41 days to a course of 32 lectures and 9 classes at the College of Agriculture, Saidapet.

27. A description of the breeds of cattle in the five districts selected for Bacteriological Survey has still to be prepared. The Superintendent's attention has been drawn to the matter.

28. Of the thirteen Stock Inspectors in service at the beginning of the year, six were dispensed with in accordance with the directions contained in G.O., No. 3891, dated 29th September 1896, communicated to the Superintendent, Civil Veterinary Department, in B.P., No. 273, dated 14th October 1896, while a clerk on Rs. 20 was added to the Superintendent's office establishment.

29. *Pony-breeding.*—Of the fourteen stallions that were at work at the commencement of the year, one died and another was sold. Three new stallions were purchased by the Inspector-General, Civil Veterinary Department, and added to the stock. Thus, at the close of the year, there were fifteen stallions, of which eight were stationed in Coimbatore, six in Salem, and 1 in Madura. The past year shows the greatest number of coverings (470) made in the last five years. But the average number per stallion, working throughout the year, excluding the stallions which worked during part of the year only, is only 36·8 against 39·5 of the previous year. The short work is generally attributed, in Coimbatore, (1) to the disinclination of the people to send their mares to the stallions in June and July, the mares being in poor condition at that season, and there being a difficulty in procuring fodder where the journey to the covering station is a long one, (2) to the illness of two stallions, Rajah and Max; in Salem, to the competition of the donkey-stallions provided for mule-breeding; and

in Madura, to the majority of mares being undersized and therefore unsuitable to the stallion Selim, which has since been transferred to the Coimbatore district. None of the three new stallions, which arrived in Salem on the 17th December 1896, worked during the year. The results of the coverings in 1895–96 compare unfavourably with those of the preceding year. Out of 398 mares covered, the results of 292 reported by the Revenue officers, and confirmed by the inspections of the Deputy Superintendent, Civil Veterinary Department, show 54 foalings (18 per cent.), 32 abortions (12 per cent.) and 206 unsuccessful cases (71 per cent.). The percentage of success in the previous year was 26. This poor result is ascribed, as usual, to the bad condition of the mares, owing to neglect and ill-treatment by their owners.

Two pony shows were held during the year—one in May 1896 at Tiruppur in the Coimbatore district and the other in December 1896 at Berikai in the Salem district. The reports of the shows show that the progeny of the Government stallions were generally of good quality in Coimbatore, but poor in Salem. At Hosúr, 171 ponies were castrated during the year, as against 134 during the previous year; in Coimbatore only 17 ponies were castrated as against 98 during the previous year. The short work in the latter district was ascribed chiefly to the small number of pony entires in the areas in which operations were undertaken.

30. *Mule-breeding.*—Of the four donkey-stallions, two Persian and two Punjabi, which were purchased in 1895–96, one Persian and one Punjabi were kept at Hosúr in the Salem district and the other two were stationed at Kollegal in the north of the Coimbatore district. Work was not begun till the end of the hot weather, after which, 36 coverings were effected in Coimbatore and 28 in Salem. Of the 36 mares covered in the former district, 10 belonged to Mr. Holmes, a coffee planter, at whose instance the experiment was undertaken. The small extent to which the donkey-stallions have as yet been used is attributed to the deep-rooted popular prejudice against these animals as unclean, and also to the illness of one of the stallions. Time and the handsome rewards which are offered for the exhibition of mule foals will, it may be hoped, gradually overcome this prejudice; and, meanwhile, the beginning made is far from discouraging.

31. *Cattle Fairs.*—The provisions of the Cattle Disease Prevention Act (Act II of 1866) were enforced at certain cattle fairs in South Canara, Salem, North Arcot, South Arcot, Tanjore, Madura and Tinnevelly at the request of the Collectors of these districts.

32. *Mortality among Live-stock from Diseases, and Attacks of Snakes and Wild Beasts.*—The mortality among cattle from diseases and attacks of snakes and wild beasts during 1896–97, as compared with that in the previous year, and with the average of the five years ending 1895–96 is given in the subjoined table:—

Causes of death.	Number amongst cattle.			Number amongst horses and ponies.		
	Average for five years ending 1895–96.	In 1895–96.	In 1896–97.	Average for five years ending 1895–96.	In 1895–96.	In 1896–97.
1	2	3	4	5	6	7
Diseases—						
Rinderpest	14,424	21,475	43,959	..	..	..
Diarrhœa and dysentery	18,072	11,089	17,433	19	44	21
Total ..	32,496	32,564	61,392	19	44	21
Anthrax	17,812	17,746	21,898	17	5	10
Epizootic aphtha	6,444	3,477	2,706	..	..	..
Variola *	2,072	2,063	3,987	..	..	..
Others	33,009	36,439	35,197	146	163	132
Total deaths from diseases ..	91,833	92,289	125,180	182	212	163
Killed by snakes and wild beasts—						
Snakes	2,249	2,656	2,024	8	8	4
Wild beasts	10,433	10,566	9,501	167	119	114
Poisoning criminal	23	21	19	..	..	..
Total ..	12,705	13,243	11,544	175	127	118
Grand Total ..	104,538	105,532	136,724	357	339	281

* Deaths shown against this disease are, in most cases, suspected to be due to rinderpest.

33. *Cattle Diseases.*—The number of deaths among cattle from diseases was 35·6 per cent. higher than in the previous year, and 36·3 higher than the average of the five years ending 1895–96. Nearly half of the number of deaths from diseases was contributed by rinderpest and diarrhœa and dysentery, which showed a large increase of 88·5 per cent. over the corresponding figures of the previous year. Deaths from anthrax, the next most fatal disease, accounted for 17·5 per cent. of the total, and showed an increase of 23·4 per cent. over the figures of the previous year. The number of deaths from unspecified diseases exhibited a slight decrease during the year under report, this item accounting for about 28·1 per cent. of the total mortality from disease. The only other head under which a decrease is to be observed is "Epizootic aphtha."

Rinderpest was especially rife in Gódávari, Kurnool, Bellary, Anantapur, Cuddapah, Nellore and Chingleput, these districts contributing 88 per cent. of the total number of deaths from this cause. More than one-third of the deaths from diarrhœa and dysentery were reported from Chingleput, while Kistna and Gódávari contributed largely to the total. Anthrax was especially prevalent in Gódávari and Chingleput, these two districts contributing nearly half the total; Kistna, Nellore, North Arcot and Tanjore also suffered severely from this disease. Epizootic aphtha was distributed throughout the Presidency, but Ganjám was exceptional in its losses from variola, so far as the mortality returns go, but the deaths were probably really due to rinderpest. Numerous deaths from unspecified diseases were reported from Gódávari, Kistna, Kurnool, Bellary, Anantapur, Cuddapah, Nellore, Chingleput and Coimbatore, which contributed together 85·3 per cent. of the total deaths from such causes.

34. Taking the losses from all diseases together, the death-rate was highest in Chingleput, being 31·2 per mille of the total stock; Kurnool and Bellary coming next with a death-rate of 22·1 per mille.

The subjoined statement compares the total number of deaths from diseases amongst cattle and horses during the year under review with the numbers returned in the previous year and with the average of the five years ending 1895–96, so far as Government villages are concerned:—

Year.	Horned cattle.			Horses and ponies.		
	Number of		Rate per mille.	Number of		Rate per mille.
	Stock.	Deaths from diseases.		Stock.	Deaths from diseases.	
1891–92	14,849,000	87,349	5·9	42,000	155	3·7
1892–93	14,342,000	101,990	7·1	40,000	142	3·5
1893–94	16,192,000	86,554	5·3	41,000	226	5·5
1894–95	16,112,000	82,217	5·1	37,000	171	4·6
1895–96	16,327,000	90,102	5·5	41,000	208	5·1
Average ..	15,564,000	89,642	5·7	40,000	180	4·5
1896–97	15,582,000	122,726	7·9	40,000	162	4·0

The death-rate among cattle was far above the average, while among horses and ponies it was slightly below it.

35. *Deaths caused by Snakes and Wild Beasts.*—There was a noticeable decrease in the number of cattle killed by snakes and wild beasts. The subjoined statement shows the action taken in the cases of criminal poisoning that occurred during the year under report:—

District.	Month.	Number of cattle poisoned.	Action taken.
1	2	3	4
Gódávari.. ..	April 1896	2	No criminal action was taken either of these cases, as the owners of the cattle merely suspected that death might have resulted from the effects of poison, and could not produce witnesses to prove their suspicion.
Kistna	June 1896	2	In one case three persons were convicted and sentenced to imprisonment, and in the other the accused was discharged for want of proof.
	January 1897	2	.....
Kurnool	January 1897	1	Two persons were convicted, and sentenced to rigorous imprisonment and fine.
Cuddapah ..	December 1896	3	Not reported.
Nellore	September 1896	1	The culprit was sentenced to two months' rigorous imprisonment.
Coimbatore ..	April 1896	1	The accused were discharged for want of evidence.
	July 1896	1	Do. do. do.
	December 1896	2	The matter was dropped as the owner of the cattle did not take any steps to detect the real culprits.
	January 1897	2	The accused were all discharged.
Tanjore	September 1896	1	The accused were discharged for want of evidence.
	January 1897	1	The case was dismissed for want of evidence.
	Total ..	19	

VII.—MISCELLANEOUS.

36. *Crop Forecast.*—During the year, ground-nut and sugarcane were added to the list of crops, for which forecasts are to be prepared. The forecasts of the listed crops were issued on the dates noted in the subjoined table:—

Crops.	Reports.		
	Sowings.	Forecast (first).	Forecast (second).
Paddy	15th October	16th December ..	18th February.
Indigo	16th September ..	15th ,, ..	....
Gingelly (early)	16th August	2nd November ..	....
Do. (late)	2nd January	15th April	....
Cotton (first)	15th August	10th December. ..	13th February.
Do. (second)	10th October		
Ground-nut	....	19th February	....
Sugarcane	....	19th ,, ...	....

37. *Exploration for Minerals.*—The Geological Survey of the Salem and Coimbatore districts was continued by Mr. Middlemiss and is expected to be completed during 1897. An examination was made of some gold-bearing reefs near Kollegal. The special investigation of the corundum-bearing rock has resulted in the discovery not only of many new fields, but also of the fact that the corundum occurs in definite bands of rock which can be followed with almost the same certainty as a seam of coal. The preliminary survey being sufficiently advanced to render the commencement of exploratory workings desirable with a view to testing the extent and richness of the corundum-bearing rock, arrangements were made by the Survey Department with the Government for carrying out this work, and a series of excavations is now being made by the Public Works Department at places pointed out by Mr. Middlemiss.

Several new discoveries of iron ores were made, and old fields were visited. A specialist, however, gave reasons for believing that the manufactured charcoal iron of this Presidency cannot compete with the imported product, but his figures and reasons are not considered decisive. Enquiries are being made, by the Forest Department as to the supply of charcoal which can be annually relied on, and the price at which it can be laid down and the Government of Madras has recommended that 300 tons of Korijamalai iron ore and 600 tons of Bengal coal may be sent to England in view to experiments being made on a large scale as to the best method of working up the ore with the fuel obtainable in India.

In accordance with the instructions of Government a consignment of steatite was collected for shipment to England.

38. *Rail-borne trade of the Presidency.*—In September 1896, the registration of rail-borne trade statistics, which had been previously carried on under the supervision of the Examiner of Guaranteed Railway Accounts, Bombay, was undertaken by the various Railway companies, the cost of the establishment necessary for the work being met by Government. The compilation of the quarterly returns was, as usual, carried out in the office of the Examiner of Guaranteed Railway Accounts, Bombay, and the annual returns, which are compiled from the quarterly returns, will be issued shortly with a separate review. They show that the total amounts of the rail-borne trade of this Presidency during 1896–97 was the largest recorded since registration was first undertaken. The increase was chiefly due to the extension of the East Coast lines and to the large export of food-grains to other provinces, where dearth prevailed. The subjoined statement summarises the figures for the last six years :—

Years.	Imports.		Exports.		Integral.		Total.	
	Amount.*	Value.†	Amount.*	Value.†	Amount.*	Value.†	Amount.*	Value.†
	MDS.	RS.	MDS.	RS.	MDS.	RS.	MDS.	RS.
1891–92	7,027	5,25	4,717	3,61	27,305	19,79	39,049	28,65
1892–93	7,257	5,53	5,399	4,16	24,110	20,44	36,766	30,13
1893–94	7,661	5,64	6,125	4,46	25,021	21,45	38,807	31,55
1894–95	8,645	6,66	6,571	4,65	30,802	27,85	46,018	39,16
1895–96	8,943	6,69	7,330	4,82	32,521	30,27	48,794	41,78
1896–97	7,180	6,64	9,118	5,37	33,074	33,47	49,372	45,48

* Thousands of maunds. † Lakhs of rupees.

The increase, as compared with the figures of the previous five years, occurred chiefly under the head of exports. The small increase in the internal trade was more than counterbalanced by the decrease in the imports from other provinces, the imports in the year under report being smaller than in any one of the previous five years except 1891–92. Imports from other provinces consisted mainly of coal and coke from Hyderabad and grain and pulse from Mysore. Compared with the previous year, there was a decrease of nearly 20 per cent. in the volume and 0·7 per cent. in the value of this trade. The decrease in the volume of imports is to be attributed to a considerable extent to the falling off in the import of grain and pulse. The cause of this was the large demand in distressed areas outside the Presidency, and the consequent rise in prices furnishes also to a certain extent the explanation of the disproportionate decrease in the value, as compared with the volume of the trade.

As compared with the average of the previous five years, exports to other provinces showed an increase of 51 per cent. in volume and 50 per cent. in value. As compared with the preceding year, exports increased by nearly 25 per cent. in volume and by nearly 11 per cent. in value. The increase is to be attributed to large consignments of coal and coke to the Mysore Province, for the Kolar gold fields, and of grain and pulse to Bombay, Bengal, Hyderabad and Mysore.

The internal trade of the Presidency increased by nearly 2 per cent. in volume, and by about 10 per cent. in value, the increase occurring chiefly under the heads of grain and pulse, metals, cotton (raw), and spices.

The distribution of the total trade of the Presidency among the different blocks into which it is divided for purposes of registration is shown below :—

Internal blocks of the Presidency.	Imports.								
	1895–96.				1896–97.				Percentage of increase or decrease.
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		
			Quantity.	Percentage.			Quantity.	Percentage.	
1	2	3	4	5	6	7	8	9	10
Sea-ports.	MDS.	MDS.	MDS.		MDS.	MDS.	MDS.		
Vizagapatam	6,711	1,453,006	1,459,717	3·5	80,695	2,099,591	2,180,286	5·4	+ 49·3
Cocanada	744,974	1,077,919	1,822,893	4·4	559,235	2,003,525	2,562,760	6·4	+ 40·6
Madras	1,434,904	6,633,269	8,068,173	19·5	1,320,794	6,061,523	7,382,317	18·3	— 8·5
Pondicherry	6,620	717,240	723,860	1·7	3,698	502,170	505,868	1·3	— 30·1
Cuddalore	2,562	656,312	658,874	1·6	549	716,409	716,958	1·8	+ 8·8
Negapatam	16,208	1,173,585	1,189,793	2·9	9,098	1,762,969	1,772,067	4·4	+ 49·0
Tuticorin	31,803	1,222,890	1,254,693	3·0	27,272	1,699,487	1,726,759	4·3	+ 37·6
Calicut	53,078	554,228	607,306	1·5	46,560	885,449	932,009	2·3	+ 53·5
Internal blocks.									
Northern Circars ..	420,663	1,239,661	1,660,324	4·0	524,903	432,612	957,515	2·4	— 42·3
Kistna and Gódávari ..	3,417,895	313,533	3,731,428	9·0	2,161,966	634,039	2,795,999	6·9	— 25·1
Deccan districts ..	1,133,599	1,466,323	2,599,922	6·3	1,016,736	1,808,800	2,825,536	7·0	+ 8·6
Chingleput and North Arcot	464,096	2,295,462	2,759,558	6·7	431,702	2,837,129	3,268,331	8·1	+ 18·5
South Arcot and Tanjore	107,349	3,731,313	3,838,662	9·3	56,403	4,050,741	4,107,144	10·2	+ 7·0
Salem, Coimbatore and Trichinopoly ..	888,519	4,531,424	5,419,943	13·0	773,128	3,737,123	4,510,251	11·2	— 16·8
Madura and Tinnevelly.	89,793	4,647,586	4,737,379	11·4	74,932	3,141,983	3,216,915	8·0	— 32·1
Malabar	123,993	807,372	931,365	2·2	92,171	701,048	793,219	2·0	— 14·8
(Block not known) ..	..	..	..	..	..	..	..	..	..
Total ..	8,942,767	32,521,123	41,463,890	100·0	7,179,836	33,074,598	40,254,434	100·0	— 2·9

Internal blocks of the Presidency.	Exports.								
	1895–96.				1896–97.				Percentage of increase or decrease.
	Foreign.	Internal.	Total.		Foreign.	Internal.	Total.		
			Quantity.	Percentage.			Quantity.	Percentage.	
	11	12	13	14	15	16	17	18	19
Sea-ports.	MDS.	MDS.	MDS.		MDS.	MDS.	MDS.		
Vizagapatam	953	897,485	898,438	2·3	157,336	124,191	281,527	0·7	— 68·7
Cocanada	185,771	317,789	503,560	1·3	317,576	649,289	966,865	2·3	+ 92·0
Madras	3,589,863	4,231,019	7,820,882	19·6	3,706,981	3,868,060	7,575,041	18·0	— 3·1
Pondicherry	1,936	44,897	46,833	0·1	1,965	48,548	50,513	0·1	+ 8·5
Cuddalore	1,643	854,586	856,229	2·1	1,718	1,223,421	1,225,139	2·9	+ 43·1
Negapatam	1,815	932,514	934,329	2·3	2,484	1,173,348	1,175,832	2·8	+ 25·8
Tuticorin	461	2,278,179	2,278,640	5·7	420	1,526,067	1,526,487	3·6	— 33·0
Calicut	60,031	717,707	777,738	1·9	26,141	624,593	650,734	1·5	— 16·3
Internal blocks.									
Northern Circars ..	40,513	2,309,406	2,349,919	5·9	728,052	3,961,666	4,689,718	11·1	+ 99·6
Kistna and Gódávari ..	888,193	1,188,944	2,077,137	5·2	824,454	1,040,468	1,864,922	4·4	— 10·2
Deccan districts ..	892,786	2,804,820	3,697,606	9·3	1,285,992	1,920,010	3,206,002	7·6	— 13·3
Chingleput and North Arcot	400,023	5,318,443	5,718,466	14·3	467,095	4,848,032	5,315,127	12·6	— 7·0
South Arcot and Tanjore	169,073	4,46,1874	4,630,947	11·6	243,681	5,003,737	5,247,418	12·5	+ 13·3
Salem, Coimbatore and Trichinopoly ..	763,491	3,048,014	3,811,505	9·7	940,315	3,534,963	4,475,278	10·6	+ 17·4
Madura and Tinnevelly.	4,707	1,757,739	1,762,446	4·4	12,252	2,005,426	2,017,678	4·8	+ 14·5
Malabar	328,327	1,357,707	1,686,034	4·3	401,610	1,522,779	1,924,389	4·5	+ 14·1
(Block not known) ..	..	..	..	..	1	..	1	..	..
Total ..	7,329,586	32,521,123	39,850,709	100·0	9,118,073	33,074,598	42,192,671	100·0	+ 5·9

39. *Road-traffic.*—Traffic was registered at 26 stations during 1895–96. The prescribed period of registration having been completed at the close of that year at nine of these stations, operations were discontinued at them, and nine new stations were opened during the year under report. Complete statistics are now available for 28 stations. Under the orders of Government, an additional station was opened at the Half-way House between Coonoor and Ootacamund on 7th February 1897. The following table shows the different stations at which registration was being conducted at the close of the year:—

Districts.	Registering stations.	Description of the road.	Routes for which traffic was registered.	Years in which previously taken up.	
1	2	3	4	5	
Ganjám	1. Russellkonda	Aska roads	1. Russellkonda to Baliabadra	1890–91 ..	1895–96
			2. Aska to Kalingiah	Do. ..	Do.
	2. Purushottapur	....	3. Aska to Purushottapur	Do. ..	Do.
			4. Aska to Humma	Do. ..	Do.
	3. Iyenjalli	....	5. Aska to Berhampur	Do. ..	Do.
	4. Varanasi (Baléru)	Between Battili, Parlákimedi and Calingapatam.	6. Battili to Parlákimedi	Do. ..	..
			7. Do. to Híramadalam	Do. ..	..
Vizagapatam	5. Korapatti	Road to Jeypur	8. Salur to Jeypur	1891–92 ..	..
			9. Do. to Nowrangpur	Do. ..	..
Kistna	6. Pidugurala	Hyderabad to Guntúr	10. Guntúr to Hyderabad	1890–91 ..	1895–96
			11. Ongole to do.	Do. ..	Do.
Nellore	7. Lingamgunta	Cumbum to Ongole	12. Do. to Cumbum	1891–92 ..	Do.
			13. Kanigiri to Cumbum	Do. ..	Do.
	8. Chinnarikatta	....	14. Ongole to Cumbum	Do. ..	Do.
			15. Do. to Kanigiri	Do. ..	Do.
	9. Sangam	Nellore to Badvel	16. Nellore to Kaligiri	Do. ..	Do.
			17. Do. to Badvel	Do. ..	Do.
Cuddapah	10. Badvel	Cuddapah to Cumbum	18. Badvel to Cumbum	1888–89 ..	Do.
			19. Do. to Puttur	Do. ..	Do.
			20. Do. to Sidhout	Do. ..	Do.
			21. Do. to Nellore	Do. ..	Do.
Kurnool	11. 31st mile, Kurnool-Gooty road ..	Gooty to Kurnool	22. Dhone to Kurnool	..	..
South Arcot	12. Sattyatope	Panruti to Kumbakónam	23. Salem to Porto Novo	1891–92 ..	..
			24. Kumbakónam to Panruti	Do. ..	..
	13. Rayappanur	Cuddalore to Salem	25. Salem to Cuddalore	1890–91 ..	..
			26. Do. to Porto Novo	Do. ..	..
	14. Vriddhachalam	....	27. Do. to Cuddalore	Do. ..	..
	15. Veppur	Villupuram to Trichinopoly	28. Do. to do.	Do. ..	..
			29. Villupuram to Trichinopoly	Do. ..	..
Madura	16. Tirumangalam	Madura to Tinnevelly *vid* Srívilliputtúr ..	30. Tinnevelly to Periyakulam	Do. ..	1895–96
			31. Do. to Solavandan	Do. ..	Do.
			32. Do. to Madura	Do. ..	Do.
			33. Madura to Periyakulam	Do. ..	Do.
	17. Sivaganga	Madura to Tondi	34. Mélúr to Sivaganga	1888–89 ..	..
	18. Ramnad (Mulakottalam)	Madura to Ramnad	35. Sivaganga to Ramnad	Do. ..	..
	Do. (Kanikarai centre) ..	....	36. Ramnad to Pámban	Do. ..	..
Tinnevelly	19. Sankaranayinárkóyil	Madura to Tinnevelly *viâ* Srívilliputtúr ..	37. Madura to Tinnevelly	1890–91 ..	1895–96
			38. Kalugumalai to Sankaranayinárkóyil	Do. ..	Do.
	20. Rajapalayam	....	39. Madura to Sankaranayinárkóyil	Do. ..	Do.
			40. Do. to Tenkási	Do. ..	Do.
Coimbatore	21. Palladam	Trichinopoly to Palghat *viâ* Karur Kangayam, Pollavaram and Coimbatore.	41. Malabar to Tiruppur	1892–93 ..	Do.
			42. Do. to Madura	Do. ..	Do.
			43. Do. to Trichinopoly	Do. ..	Do.
	22. Kangayam	....	44. Karúr to Coimbatore	Do. ..	Do
			45. Do. to Tiruppur	Do. ..	Do.
			46. Dhárápuram to Perundurai	Do. ..	Do.
			47. Do. to Uttukuli	Do. ..	Do.
			48. Do. to Kodimudi	Do. ..	Do.
			49. Kodimudi to Uttukuli	Do. ..	Do.
			50. Do. to Coimbatore	Do. ..	Do.
	23. Karúr	Karúr to Pollachi *viâ* Dhárápuram and Udamalpet.	51. Karúr to Kangayam	Do. ..	Do.
			52. Do. to Dhárápuram	Do. ..	Do.
	24. Coimbatore	Trichinopoly to Palghat *viâ* Karur, Kangayam, &c.	53. Coimbatore to Pollachi	Do. ..	Do.
			54. Do. to Palghat	Do. ..	Do.
Malabar	25. Sultan Tod	Canal from South Canara to Cannanore ..	55. Balayapatam to Kavai	Do. ..	Do.
	26. Kuthaparamba	Road from Periya Ghât to the coast ..	56. Periya to Tellicherry	Do. ..	Do.
The Nilgiris	27. Half-way House *	Coonoor to Ootacamund	57. Coonoor to Ootacamund	..	..

* NOTE.—Registration commenced on 7th February 1897.

APPENDIX I.

STATISTICS of mortality from diseases, criminal poisoning and attacks of snakes and wild beasts reported among cattle in the Madras Presidency during the year 1896–97.

Districts.	Total stock.	Deaths due to diseases.								Deaths due to			Total deaths from the causes named.	
		Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	* Variola.	Other diseases.	Total.		Snake-bite.	Attacks of wild animals.	Criminal poisoning.	Number.	Rate per mille.
								Number.	Rate per mille.					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ganjám	364,781	887	741	405	222	2,192	752	5,199	14·2	63	178	..	5,440	14·9
Vizagapatam	159,670	234	194	405	198	33	501	1,565	9·8	55	69	..	1,689	10·6
Gódávari	888,018	3,830	1,254	5,768	489	531	2,341	14,213	16·1	193	348	2	14,756	16·6
Kistna	1,208,198	254	2,286	1,376	76	458	4,796	9,246	7·6	107	136	4	9,493	7·8
Kurnool	647,164	7,808	818	647	114	..	4,898	14,285	22·1	65	321	1	14,672	22·7
Bellary	604,522	8,587	993	836	171	20	2,751	13,358	22·1	21	109	..	13,488	22·3
Anantapur	643,719	7,162	746	303	73	181	3,887	12,352	19·2	7	187	..	12,546	19·5
Cuddapah	1,054,399	3,034	491	734	79	109	2,395	6,842	6·5	57	620	3	7,522	7·1
Nellore	722,870	3,149	610	1,029	23	169	2,832	7,812	10·8	37	37	1	7,887	10·9
Chingleput	608,709	4,192	6,366	4,436	231	94	3,682	19,001	31·2	453	25	..	19,479	32·0
South Arcot	1,189,172	386	716	960	65	2	623	2,752	2·3	121	153	..	3,026	2·6
North Arcot	918,806	1,917	473	1,528	92	..	42	4,052	4·4	166	489	..	4,707	5·1
Salem	1,051,975	15	60	62	24	2	281	444	0·4	18	159	..	621	0·6
Coimbatore	1,158,002	50	110	308	65	33	2,065	2,631	2·3	52	922	6	3,611	3·1
Trichinopoly	602,468	30	86	261	21	1	466	865	1·4	29	79	..	973	1·6
Tanjore	951,577	337	330	1,351	172	16	797	3,003	3·1	111	8	2	3,124	3·3
Madura	623,911	100	255	618	157	107	942	2,179	3·5	109	249	..	2,537	4·1
Tinnevelly	474,036	117	113	272	20	1	214	737	1·6	87	32	..	856	1·8
Nilgiris	67,273	2	21	..	42	..	30	95	1·4	7	360	..	462	6·9
Malabar	956,986	93	466	51	108	..	167	885	0·9	141	2,072	..	3,098	3·2
South Canara	686,119	565	112	79	154	14	286	1,210	1·8	12	2,716	..	3,938	5·7
Total ..	15,582,375	42,749	17,241	21,429	2,596	3,963	34,748	122,726	7·9	1,911	9,269	19	133,925	8·6
In Zemindaris.														
Vizagapatam	Not available.	149	154	268	55	24	324	974	..	40	38	..	1,052	..
Kistna		..	..	..	..	..	..	..	..	2	..	..	2	..
Bellary		277	4	4	3	..	81	369	..	1	68	..	438	..
Nellore		37	1	6	..	..	16	60	..	1	..	..	61	..
North Arcot		747	33	191	52	..	28	1,051	..	69	126	..	1,246	..
Total ..	....	1,210	192	469	110	24	449	2,454	..	113	232	..	2,799	..
Grand Total ..	....	43,959	17,433	21,898	2,706	3,987	35,197	125,180	..	2,024	9,501	19	136,724	..

* Deaths noted under this head are, in most cases, suspected to be due to rinderpest.

APPENDIX II.

MONTHLY statistics of mortality among cattle in the Madras Presidency during the year 1896-97.

Months.	Deaths due to diseases.							Deaths due to			Total deaths from the causes named.
	Rinderpest.	Diarrhœa and dysentery.	Anthrax.	Epizootic aphtha.	Variola. *	Other diseases.	Total.	Snake-bite.	Attacks of wild animals.	Criminal poisoning.	
1	2	3	4	5	6	7	8	9	10	11	12
April 1896 ..	3,309	1,021	797	276	100	1,985	7,488	111	556	3	8,158
May ,, ..	3,592	693	1,291	215	44	2,535	8,370	127	620	..	9,117
June ,, ..	3,710	944	1,866	176	107	2,841	9,644	121	666	2	10,433
July ,, ..	2,795	932	1,868	201	166	3,965	9,927	182	893	1	11,003
August ,, ..	3,787	1,180	2,264	115	218	3,565	11,129	177	857	..	12,163
September ,, ..	2,939	1,548	2,004	126	183	2,352	9,152	211	887	2	10,252
October ,, ..	3,628	1,544	2,304	150	408	3,304	11,338	194	963	..	12,495
November ,, ..	3,675	1,500	2,165	283	937	3,744	12,304	229	1,017	..	13,550
December ,, ..	4,103	2,270	2,677	174	798	2,896	12,918	213	890	5	14,026
January 1897 ..	4,883	2,384	1,979	340	549	2,859	12,994	170	823	6	13,993
February ,, ..	3,786	1,924	1,454	253	180	2,704	10,301	142	638	..	11,081
March ,, ..	3,752	1,493	1,229	397	297	2,447	9,615	147	691	..	10,453
Total ..	43,959	17,433	21,898	2,706	3,987	35,197	125,180	2,024	9,501	19	136,724

* Deaths noted under this head are, in most cases, suspected to be due to rinderpest.

APPENDIX III.

STATISTICS of mortality from diseases criminal poisoning and attacks of snakes and wild beasts reported among horses and ponies in the Madras Presidency during the year 1896-97.

Districts.	Total stock.	Deaths due to diseases.					Deaths due to			Total deaths from the causes named.	
		Diarrhœa and dysentery.	Anthrax.	Other diseases.	Total.		Snake-bite.	Attacks of wild animals.	Criminal poisoning.	Total.	Rate per mille.
					Number.	Rate per mille.					
1	2	3	4	5	6	7	8	9	10	11	12
Ganjám	225	..	..	..	..	..	..	..	..	..	..
Vizagapatam	163	1	..	..	1	6·1	..	..	..	1	6·1
Gódávari	2,825	4	4	13	21	7·4	1	8	..	30	10·6
Kistna	3,921	..	..	23	23	5·9	1	3	..	27	6·9
Kurnool	3,008	..	..	9	9	2·9	..	22	..	31	10·3
Bellary	4,216	11	..	(a) 22	33	7·8	..	13	..	46	10·9
Anantapur	3,111	1	2	(b) 21	24	7·7	..	11	..	35	11·2
Cuddapah	1,784	(c) 1	2	3	6	3·4	..	2	..	8	4·5
Nellore	1,046	..	..	7	7	6·7	1	2	..	10	9·5
Chingleput	1,219	..	..	14	14	11·5	..	..	..	14	11·5
South Arcot	2,418	..	..	..	..	..	..	..	..	..	..
North Arcot	1,956	..	..	..	..	..	..	1	..	1	0·5
Salem	3,442	..	..	..	..	..	..	1	..	1	0·3
Coimbatore	3,460	1	1	4	6	1·7	..	15	..	21	6·1
Trichinopoly	769	..	..	10	10	13·0	..	..	..	10	13·0
Tanjore	1,354	1	..	1	2	1·5	..	..	..	2	1·5
Madura	2,266	..	..	4	4	1·7	1	14	..	19	8·4
Tinnevelly	508	..	..	..	..	..	..	..	..	..	..
The Nilgiris	1,389	..	..	..	..	..	..	18	..	18	13·0
Malabar	939	..	..	(d) 1	1	1·0	..	..	..	1	1·0
South Canara	222	1	..	..	1	4·5	..	..	..	1	4·5
Total ..	40,241	21	9	132	162	4·0	4	110	..	276	6·8
In Zemindaris.											
Vizagapatam	Not available.	..	..	..	..	..	..	..	..	..	..
Kistna		..	..	..	..	..	..	..	..	..	..
Bellary		..	..	..	..	..	..	3	..	3	..
Nellore		..	..	..	..	..	..	..	..	..	..
North Arcot		..	1	..	1	..	..	1	..	2	..
Total ..	..	..	1	..	1	..	..	4	..	5	..
Grand Total ..	..	21	10	132	163	..	4	114	..	281	..

(a) A case was wrongly reported by the Collector under epizootic aphtha in May 1896 and two other cases under rinderpest in March 1897.

(b) Two cases were wrongly reported by the Collector under variola—one in July 1896 and another in February 1897.

(c) A case was wrongly reported by the Collector under rinderpest in April 1896.

(d) A case was wrongly reported by the Collector under epizootic aphtha in May 1896.

APPENDIX IV.

MONTHLY statistics of mortality from diseases criminal poisoning and attacks of snakes and wild beasts among horses and ponies in the Madras Presidency during the year ending 1896-97.

Months.	Number of deaths due to diseases.				Number of deaths due to			Total deaths from the causes named.
	Diarrhœa and dysentery.	Anthrax.	Other causes.	Total.	Snake-bite.	Attacks of wild animals.	Criminal poisoning.	
1	2	3	4	5	6	7	8	9
April 1896	2	..	4	6	1	4	..	11
May ,, ...	1	1	6	8	..	4	..	12
June ,, ...	7	..	17	24	..	10	..	34
July ,, ...	1	..	17	18	..	12	..	30
August ,, ...	..	4	22	26	..	6	..	32
September ,, ...	1	..	8	9	..	7	..	16
October ,, ...	1	1	6	8	..	13	..	21
November ,, ...	3	3	8	14	1	7	..	22
December ,, ...	1	1	3	5	..	12	..	17
January 1897	1	..	9	10	1	12	..	23
February ,, ...	..	..	24	24	1	12	..	37
March ,, ...	3	..	8	11	..	15	..	26
Total ..	21	10	132	163	4	114	..	281

Resolution of the Board of Revenue (R.S., L.R. and Agri.), No. 657, dated 11th October 1897.

The Board begs to submit, for the information of Government, its report on the operations of the Department of Land Records and Agriculture during the year 1896-97.

2. The permanent Director Mr. H. M. Winterbotham proceeded to England on a year's furlough in May 1896, and was succeeded by Mr. W. J. H. LeFanu, who remained in charge of the Department till the close of the year.

3. The Deputy Director, Mr. Benson, continued to be in charge of both the Land Records and Agricultural branches till the 12th March 1897, when he proceeded on a year's furlough on medical certificate. Both Departments were in charge of the Secretary, Settlement Department, from 12th to 26th March, when the ordinary duties of the Deputy Director, Land Records and Agriculture, were transferred to the Temporary Famine Secretary to the Board of Revenue. During April, May and a portion of June and September 1896, the Deputy Director was engaged at head-quarters in formulating proposals for the revision of the village manual, and in doing other miscellaneous work. From the latter month to November, he was on tour in Gódávari, South Arcot and Tanjore, in connection with the inspection of the village and taluk accounts. From November up to the date of his proceeding on leave, he was engaged at head-quarters in famine work. During the period of his stay at head-quarters, he discharged, as usual, a certain amount of Secretariat work under the Board in addition to his other duties.

Order—No. 22, Revenue, dated 11th January 1898.

Miscellaneous.

With its Proceedings read above, the Board of Revenue submits its report on the operations of the Department of Land Records and Agriculture during the year 1896-97. The report which was due in the Government office on the 1st September was received more than two months late. The delay has probably to be ascribed to the pressure of famine work.

2. In the introductory portion of the report the Board refers to the recommendations of the committees which were appointed to discuss the proposals of the Simla Conference of 1893 with regard to agricultural education and the utilization of Land Records and Dr. Voelcker's report for the construction of a practical scheme of district analysis.

The Government has received a full expression of the views of the Government of India on these subjects and generally upon the measures to be adopted for future agricultural enquiry and improvement. The subject which has been exhaustively reviewed in a series of eight resolutions is under the careful consideration of the Government, and it is hoped that it may be found possible to communicate them to the Board shortly with the views of the Government thereon.

3. The eighth of the resolutions referred to above lays down instructions as to the form in which for the future the annual reports of the Department of Land Records and Agriculture should be prepared. The Government of India desires that the various chapters of the reports should deal with the divisions of the subject indicated in the eight resolutions which are as follows:—

I. Prefatory.
II. Land Records establishment.
III. Utilization of Land Records.
IV. Scientific and national enquiry under Imperial control.
V. Scientific and local enquiry under provincial direction.
VI. Agricultural education.
VII. Publication of Agricultural information.
VIII. Final.

The Board's present report is drawn up on the model of those hitherto submitted; but in the following remarks the subject will be reviewed under the headings prescribed by the Government of India.

4. *I. Prefatory.*—Mr. C. Benson continued to be Deputy Director of both the Agricultural and Land Records Branch of the Department until a few days before the close of the year under review when he proceeded on a year's furlough to England. He was on tour for about three months, inspecting village and taluk accounts. The remaining period was spent by him at head-quarters in formulating proposals for the revision of the village manual or in Secretariat work in the Board's office. Since Mr. Benson's departure on leave, the latter work has been performed by the Secretary temporarily appointed to the Board of Revenue for famine purposes. The Board's scheme for the re-organization of the Survey department as a Special Land Records department referred to in paragraph 3 of the review of the previous year's report is still under the consideration of His Excellency the Governor in Council. The policy of agricultural improvement enunciated by the Government of India in the eight resolutions already referred to has necessitated a careful reconsideration of the whole subject.

5. *II. Land Records Establishment.*—Survey schools for the instruction of karnams in survey were held in 127 out of 156 taluks of the Presidency and 12,913 karnams were instructed during the year. A much higher standard of proficiency than that required hitherto was exacted at the examinations held at the close of the schools.

It is satisfactory to note that nearly 95 per cent. of the Revenue Inspectors, now in the service, are men who have had a regular training in survey work.

6. *III. Utilization of Land Records.*—The preparation and checking of village registers and firka books have been pushed on as much as possible. Reports on the economic condition of all the districts as disclosed by the examination of the village registers and firka books to the end of fasli 1303 have been received and reviewed by the Board and submitted for the information of Government. These reports will in future be submitted decennially as decided by the Government on the recommendation of the Local Conference held in December 1895, and the Government approves of the Board's instructions that the next set of reports should be submitted before the close of the next census year 1901, and should embody all the information necessary for the revision up to the close of the preceding fasli year of the district memoirs published in the statistical atlas of the Presidency. It is noted that the Board has issued the necessary instructions for the introduction of the revised forms of firka books approved of by the Government. In view of the instructions of the Government of India it may be again necessary to revise the form and contents of these books.

7. *IV. Scientific and national enquiry under Imperial control.*—In pursuance of the scheme of practical investigation of the mineral products of the Presidency undertaken by this Government, Messrs. Middlemiss and Holland of the Geological Survey of India were engaged during the year in examining and describing the corundum and

certain other less important deposits in the Salem and Coimbatore districts. Practical experiments in extracting and cleaning corundum were undertaken by Mr. Middlemiss. From Mr. Middlemiss's report on the subject, the results of these experiments appear to be discouraging and go to show that the mineral cannot, at the present market price, be extracted at a profit. The question of employing Mr. Middlemiss in other directions is at present under correspondence with the Director of the Geological Survey.

A scheme for carrying on Bacteriological work in this Presidency was drawn up by the Inspector-General of the Civil Veterinary Department during the year under review, and this was approved by Government, but owing to the famine but little effect can yet have been given to the scheme. Now, however, that the Stock Inspectors, most of whom were employed on famine duty, have been relieved of that work and have reverted to their ordinary duties, the matter should receive attention.

8. *V. Scientific and local enquiry under Provincial direction.*—Some interesting crop and dairy experiments were carried on in the farm attached to the College of Agriculture at Saidapet, and the results obtained are fully set forth in paragraph 17 of the Board's report. The opening of an experimental farm at Bellary or Coimbatore as directed in G.O., No. 490, dated 24th September 1896, has been postponed owing to Mr. Benson's absence on furlough. The question of what measures should be taken in this direction on the return of that officer is under the consideration of the Government with reference to the views of the Government of India on the subject. The minor experiments referred to in the Board's report do not call for any special remarks.

Pony and mule breeding operations are carried on under Provincial direction and the results obtained are briefly set forth by the Board in paragraphs 29 and 30 of its present report. The subject has already been fully reviewed by Government in G.O., No. 814, dated 27th September 1897.

9. *VI. Agricultural Education.*—The results of imparting higher education in Agriculture have also been separately reviewed by Government in G.O., No. 636, Educational, dated 12th November 1897, on the report on the working of the College of Agriculture. The question of elementary agricultural education was fully discussed at the Local Conference of 1896 and the Government accepted the following recommendations of that conference, viz.—

(1) that Agriculture should not appear as a separate subject in the curriculum of rural primary schools, but an effort should be made to impart an elementary knowledge of it in the group "Object lessons and elementary science," which group should be made a compulsory subject;

(2) that Agriculture should be recognized as a separate optional subject for boys after they have passed the Fourth standard, and that, until properly-qualified teachers become available, the study of a Text-book on Agriculture in Lower Secondary schools will be better than nothing.

The subject is, however, under reconsideration with reference to the views of the Government of India.

10. *VII. Publication of Agricultural information.*—Two bulletins were issued during the year under review—one "on the use of the iron ploughs in the Ceded districts" and the other "on Tamil Sayings and Proverbs on Agriculture." A valuable and interesting bulletin embodying the results of experiments made with water-lifts by Mr. Chatterton, Professor of Engineering in the College of Engineering, was also issued after the close of the year.

11. *VIII. Final.*—To carry out the objects and policy declared by the Government of India in the eight resolutions referred to above, the department, as it at present exists in this Presidency, will need expansion and re-organization. The subject presents many difficulties not the least of which are occasioned by the present straitened condition of the finances. The Government hopes, however, that it will be found possible to make material progress towards a satisfactory solution by the end of next year.

(True Extract.)

(Signed) G. S. FORBES,
Ag. Secretary to Government.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY

FOR THE OFFICIAL YEAR

1898-99.

MADRAS:
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1899.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR 1898-99.

REPORT ON THE OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE FOR 1898-99.

I.—PREFATORY.

The Hon'ble Mr. W. J. H. LeFanu continued in charge of the department till the 5th April 1898, when the Hon'ble Mr. H. M. Winterbotham relieved him. Mr. Winterbotham was in charge of the department till 8th November 1898, when he was promoted to a seat in Council. Mr. A. W. B. Higgens was then appointed Director and took charge of the department on the 1st December 1898. In the interval the work of the department was under the supervision of the Hon'ble Mr. J. Sturrock, Commissioner of Land Revenue. The permanent Deputy Director Mr. C. Benson, who was on sick leave throughout the previous year, returned to duty on the 17th April 1898. His duties were discharged by the Secretary to the Director during the first few days of the year. Veterinary Lieutenant W. B. Edwards was on duty as the Superintendent, Civil Veterinary Department, from the beginning of the year till the end of January 1899, when he reverted to military duty, handing over the charge of his office to the Deputy Director who continued in charge till the close of the year.

2. The views of the Government of India on the subjects discussed at the agricultural conferences held at the various provincial head-quarters during 1895–96 were embodied in a series of resolutions issued in March 1897, which were communicated with instructions in G.O., No. 413, Revenue, dated 27th July 1898. The first resolution dealt with the history since 1881 of the work of the Imperial Department of Agriculture; the second resolution dealt with the training, qualifications, and duties of each class of officer of a Land Records establishment; the third discussed the utilization of Land Records; the fourth treated of scientific and national enquiries connected with Agriculture; the fifth, the constitution and duties of the Provincial Agricultural departments; the sixth dealt with agricultural education; and the seventh and eighth discussed methods of publishing agricultural information and the form in which the annual administration reports of the Agricultural departments should be prepared. The whole series was more or less brought under review during the year under report and the conclusions arrived at will be mentioned below.

II.—LAND RECORDS ESTABLISHMENTS.

3. As regards the organization of a Land Records staff, a detailed and exhaustive report, prepared in consultation with the Superintendent, Revenue Survey, was submitted to Government in which the reorganization of the Survey Department and

the creation of a special Land Records staff in each district have been fully dealt with and proposals for the necessary staff were made to give effect to the proposals. The question whether it is necessary or advisable to revive the separate post of Deputy Director of Land Records was also considered in this connection, and the conclusion that it was unnecessary to do so was arrived at, since it had been found from experience that the appointment was practically of little use and that the object could be better effected by the appointment of special Deputy Collectors in each district, subject to the general control of the Collectors and the Board with some occasional assistance from the Survey Superintendent. The orders of Government on this report are still awaited.

4. Regarding the prospects of promotion to be offered to Revenue Inspectors it has been decided that no rules are necessary for reserving a certain proportion of the higher appointments to them, but orders have been recently issued to the effect that men recommended for the post of Deputy Tahsildar should have, as a rule, served as Revenue Inspectors for some time and that no man who has not undergone at least a year's training as Revenue Inspector should be appointed to any place in the districts carrying a salary of Rs. 35 or upwards; this will ensure that the post of Revenue Inspector is made a stepping stone to higher posts in a majority of cases.

5. The question of improving the survey training of Revenue Inspectors was under discussion during the year, but the correspondence on the subject was not completed till quite recently and suggestions on the subject are now before the Government.

The total number of Revenue Inspector's posts in the Presidency during the year was 634. Of these, 607 were held by men trained in survey, three posts were held by men drawing the old scale of pay and two were vacant at the end of the year. The remaining posts were held temporarily by untrained men.

6. The sanction of the Secretary of State has since been received to the scheme referred to in the last report, for the improvement of the position of the taluk establishments.

7. The orders of the Secretary of State sanctioning the scheme for the increase of the salaries of karnams were also received during the year and effect has been given to them in the marginally-noted thirteen districts. In the case of the remaining districts the enhanced scale will be adopted when the village establishments are revised.

Ganjám.	Chingleput.
Vizagapatam.	North Arcot.
Nellore.	South Arcot.
Cuddapah.	Madura.
Bellary.	Tinnevelly.
Kurnool.	Coimbatore.
Anantapur.	

8. Schools for the training of karnams in surveying were held in all the districts of the Presidency except Madras. In five districts, however, schools were not held in some of the taluks for one or other of the following reasons—(1) the prevalence of plague and (2) the employment of karnams on re-survey, on sub-division of village service inams, or in connection with janmam registration. The number of men instructed at the schools was 10,054, while 2,971 men who had been classed as "good" or "fair" in the previous year were exempted from training and were employed in completing their field-measurement books. Of those examined, nearly 50 per cent. obtained good or fair certificates. In South Canara the percentage of such men amounted to more than 75. In Vizagapatam, Gódávari, Chingleput, North Arcot, Tanjore, Tinnevelly, Malabar and Nilgiris, the percentage of good and fair ranged between 50 and 75. In the remaining districts it was below 50.

9. *The use made of the Land Records staff in connection with famine relief.*—In the year under review distress prevailed necessitating the conduct of relief operations in a portion of the Nellore district. As observed in paragraph 10 of the report for last year, it is the duty of the Land Records staff at all times to collect information and to report on the water-supplies, the progress of cultivation, the condition of the standing and the outturn of the harvested crops, and the health condition of the villagers, and of their cattle. In a season of drought when the failure of crops is complete or extensive, the inspection of the tracts affected, becomes more important with a view to granting remissions or postponements of revenue, and consequently the work of the

Land Records staff is increased. The services of the staff were fully utilised also in superintending relief operations and in conducting the necessary inquiries for the grant of State loans.

10. With a view to the more effective use of the land records and the entries therein as evidence of rights and titles, the proposal for amalgamating the Registration with the Land Records Department, which engaged the attention of the conference with Sir E. Buck in 1895–96, was thrown out by the Government of India after consulting the other Local Governments and Administrations as likely to cause administrative inconvenience and injurious dislocation of existing arrangements, and it was thought that the object could be sufficiently attained if the Director of the Land Records Department were permitted to receive copies of annual reports of the Registration Department with authority to submit thereon such suggestions and comments as may occur to him for the consideration of the higher Revenue authorities.

11. During May and June 1898, the Deputy Director visited the Nilgiri district, inspected the village and taluk accounts of Coonoor and Ootacamund and submitted a report on the results of his inspections to the Collector. From 22nd July to 21st September he was in charge of the duties of Secretary to the Director without prejudice to his own work during the absence of the latter officer on privilege leave. In December 1898, the Deputy Director accompanied Dr. Bourne, F.R.S., to the Gódávari district for the purpose of investigating a disease of the sugarcane and also to examine the irrigation accounts with a view to their simplification. A report on the latter question was submitted in the early part of January. During a portion of February and March, the Deputy Director visited the Madura and Tinnevelly districts to inspect the village and taluk accounts of the Tirumangalam and Sáttúr taluks and submitted reports to the Collectors concerned. During the same tour he inspected various sites in the two districts, with a view to determine where an experimental farm could best be started, in case Government should approve of the scheme to that end which was laid before it in February last. In the early part of March, Erode and Chidambaram were visited in connection with the work of the Civil Veterinary Department.

Much of the time of the Deputy Director was occupied throughout the year by secretariat and statistical work, and amongst other matters he prepared special papers on the following subjects:—

(1) Ground-nut trade and cultivation.
(2) Food-grains—production and consumption of.
(3) Sugar—production and trade in.
(4) Grain trade.
(5) Rail-borne trade—general review.

12. The village and taluk accounts in all districts of the Presidency were, as usual, examined at the annual settlement. Collectors report that village accounts are generally maintained in a fairly satisfactory condition, but that there is still room for improvement in the maintenance of the taluk accounts in some of the districts. Steps are being taken by Collectors to secure better results.

III.—THE UTILIZATION OF LAND RECORDS.

13. *Village Registers and Firka-books.*— The form in which the leading statistics of each village are abstracted in what are known as the "firka-books" of every Revenue Inspector's circle was again considered and it was decided that the form now in use, which was the outcome of the consultation with Sir E. Buck, answers requirements, inasmuch as it reveals at a glance variations from year to year in the cultivated and irrigated areas as well as particulars regarding wet revenue, seasonal remissions, the extent of protection from wells, collections, arrears, &c.

14. Except in the case of North Arcot, the village registers and the firka-books have been completely or almost completely prepared and checked up to fasli 1306 (1895–96). In North Arcot, the village registers and firka-books of 254 villages remain to be checked in one taluk. The reason for this non-completion has not been reported. The preparation and checking of these registers and books for fasli 1307 were completed in five, and nearing completion in the remaining districts. In the case of Anantapur, the preparation and checking of the "firka" sheets appear to have been

retarded as the registers were sent to the Deputy Commissioner of Revenue Settlement for reference and were returned only recently. The progress for fasli 1308 has not been great. In the districts of Bellary, Nellore, Coimbatore and Tanjore alone was any considerable progress made. Reports regarding this matter have not yet been received from the Collectors of Kurnool, Cuddapah and Madura. The following statement shows in one view the progress made in the several districts in the preparation, &c., of these registers :—

Districts.	Number of villages in the district.	Number of villages for which					
		Village registers remain		Firka-books remain		Village registers are	
		To be prepared	To be checked	To be prepared	To be checked	Prepared	Checked
		Up to fasli 1306.				For fasli 1307.	
1	2	3	4	5	6	7	8
Ganjám ..	1,531	..	Complete.		..	Complete.	
Vizagapatam	282		Do.			Do.	
Gódávari ..	1,457	..	..	4	4	Do.	
Kistna ..	1,377		Complete.			1,369	1,369
Kurnool ..							
Bellary ..	962	..	..	..	..	..	957
Anantapur * ..	740		Complete.			653	646
Cuddapah ..							
Nellore ..	931		Complete.			900	900
Chingleput ..	1,782		Do.			1,762	1,757
South Arcot ..	2,699		Do.			Complete.	
North Arcot ..	1,767	2	254	2	254	1,761	1,509
Salem	3,079	7	7	7	7	3,015	3,015
Coimbatore ..	1,508		Complete.			1,499	1,499
Trichinopoly ..	731		Do.			Complete.	
Tanjore ..	2,542		Do.			2,528	2,528
Madura ..							
Tinnevelly ..	1,080		No arrears.			1,059	1,059
Nilgiris ..	48		Complete.			36	36

Districts.	Number of villages for which—*cont.*					
	Firka-books are		Village registers are		Firka-books are	
	Prepared	Checked	Prepared	Checked	Prepared	Checked
	For fasli 1307—*cont.*		For fasli 1308.			
	9	10	11	12	13	14
Ganjám ..	Complete.		464	310	168	168
Vizagapatam	Do.		159	137	81	12
Gódávari	Do.		..	..	..	..
Kistna ..	1,369	1,369	430	400	218	218
Kurnool ..						
Bellary ..	825	711	627	307	..	..
Anantapur *	548	548	..	..	..	..
Cuddapah						
Nellore	848	848	672	525	248	139
Chingleput	1,762	1,737	170	130	80	80
South Arcot	Complete.			..	..	..
North Arcot	1,761	1,509	..	..	..	..
Salem ..	3,015	2,577	..	..	..	..
Coimbatore	1,499	1,492	1,135	1,077	362	340
Trichinopoly	Complete.		175	78	112	57
Tanjore ..	2,528	2,528	1,043	540	381	..
Madura ..						
Tinnevelly	1,002	863	..	..	..	..
Nilgiris ..	48	48	..	..	..	..

Incomplete in Penukonda and Hindúpur as the registers were sent to Deputy Commissioner, Settlement, for reference and not returned by him.

IV.—SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL DIRECTION.

15. *Geology.*—On re-consideration, the Geological Survey decided to undertake a detailed examination of the mica-bearing area in the Nellore district during the year, but no official information regarding the work has been communicated.

The results of the experiments made in smelting Salem iron ore with Bengal coal in England, conducted by Messrs. Bolckow Vaughan at Middlesborough were communicated by Her Majesty's Secretary of State, and showed that the sample of Salem iron ore contains barely 40 per cent. of magnetic iron; that the ore is too poor and too siliceous to be worth exporting; and that it is unsuitable for smelting in a blast furnace. Further discussion and enquiry are proceeding in the Land Revenue Department of the Board of Revenue regarding these ores, but so far the results have not been decisive.

No reports were received intimating corrections to be made in the Provisional Index of Minerals.

16. *Botany.*—The post of the Government Botanist, which had remained vacant for some years, was revived during the latter part of the year by the appointment of Mr. C. A. Barber to the post. His term of office in this Presidency has been sanctioned for five years after which his services are to be made available elsewhere in India. The chief aim of his work is to make a systematic survey of the flora of the Presidency, although his advice will be available on subjects connected with economic botany. To assist him, a small staff has been sanctioned, and his headquarters have been fixed at Ootacamund, to which place the herbarium has been transferred. Before the close of the year a tentative programme for the survey, under which the Government Botanist will spend three periods of about two or three months each during the year on tour, has been drawn up and approved, but until the close of the year Mr. Barber was chiefly engaged at Madras in arranging for the transfer of the herbarium to Ootacamund and only commenced field work later on.

17. The work of collecting specimens of the 432 articles included in the index collections for the Imperial Institute referred to in paragraph 17 of the last report was proceeded with, and a further indent, comprised in a volume of 185 pages, was received from the Reporter on Economic Products, by which 50 articles were added to the list for this Presidency. A request that the indents might be made more definite was met by the remark that the system adopted had the approval of the Government of India. In September 1898, the Reporter on Economic Products forwarded a note on the subject of *Andropogon sorghum* (cholam) and requested that information and specimens should be collected as detailed in the note. The information required is being collected, and when complete will be consolidated and published. A large number of specimens of *sorghum* have already been furnished to the Reporter on Economic Products by the Deputy Director of Agriculture.

18. *Chemistry.*—No report was received from Dr. Leather, the Assistant Agricultural Chemist to the Government of India, as to the analytical work performed by him during the time he was attached to the College of Agriculture during the year.

19. *Statistics.*—The subjoined statement shows the statistics furnished to the Government of India and the Imperial officers under the control of that Government:—

Name of report.	To whom sent.	When due.
Weekly Season report	Government of India (Revenue and Agriculture).	Every Tuesday.
Annual Programme of famine-relief works (Famine Statement C).		1st June.
Do. List of agricultural implements and machines tested and found successful.		15th November.
Do. Statement of collieries	Government of India (Finance and Commerce).	20th February.
Do. Statement of minerals	Reporter on Economic Products.	15th April.
Half-yearly Statement of wages of agricultural labourers, &c., per mensem.	Government of India (Finance and Commerce).	25th January and July.

Name of report.	To whom sent.	When due.
Outturn report on late sowings of gingelly	The Director-General of Statistics.	15th April.
First forecast of sowings of cotton		15th August.
Forecast of early sowings of gingelly		15th ,,
,, of sowings of indigo		15th September.
Second forecast of sowings of cotton		10th October.
Forecast of sowings of paddy		15th ,,
,, of outturn on the early sowings of gingelly		15th ,,
First outturn report on cotton		10th December.
,, ,, on paddy		15th ,,
Outturn report on indigo		15th ,,
Forecast of the late sowings of gingelly		1st January.
Second outturn report on cotton		10th February.
,, ,, on paddy		15th ,,
Statistics of cinchona cultivation		1st July.
Rail-borne trade and road traffic return, annual		1st October.
Quarterly Returns of rail-borne trade		1st January, April, July and October.
Returns of agricultural statistics		1st November.
Statement of cotton and hemp mills		15th January.
,, of paper and woollen mills		1st April.
Statistics of tea and coffee cultivation		1st July.
Fortnightly returns of wholesale and retail prices of certain commodities at selected marts.		10th and 25th of each month.

As the agricultural statistics for the year have not yet been compiled it is not possible to compare the estimates of area framed in the forecasts with the actual areas sown.

20. *Veterinary Science.*—Enquiries in connection with the Bacteriological Survey were conducted in six districts during the year, and reports were drawn up regarding two taluks by the Stock Inspectors. No complete work was, however, turned out by the Superintendent, Civil Veterinary Department, in this respect. Revised instructions for the conduct of the investigation have been recently issued which, it is hoped, may expedite matters. In addition to the above, particular outbreaks of cattle disease in the Nilgiris, Salem, Coimbatore, South Arcot and Tinnevelly districts were investigated by the Stock Inspectors and reported on.

The experiments alluded to in paragraph 26 of the last report, which were designed to determine the amount of risk that exists, in connection with the export trade in bones and hides, of conveying the virus of rinderpest to other countries from India, were unsuccessful and unsatisfactory. The question of making experiments on Dr. Koch's method of inoculation as a preventative of rinderpest was under discussion during the year, but nothing was done in the matter by the Superintendent, Civil Veterinary Department.

21. *Meteorology.*—The discussion of the best plan for introducing a system of flood warnings for the Kistna and the Gódávari deltas was continued during the year and it now appears that, as regards the Kistna river, a system of flood warnings similar to that contemplated by the Meteorological Reporter to the Government of India is already carried out by the Public Works Department; gauges being fixed in the Tungabhadra at Kurnool and in the Kistna at Pagatur about twelve miles from Kurnool. In the flood season, these gauges are read three times a day and reports are sent from Kurnool to Bezwada. Such warnings of a flood are generally received about 36 hours before the river begins to rise at Bezwada, though at the beginning of the season when the river is very low, a flood will frequently not be noticed at Bezwada for nearly a week after the receipt of the warning. As regards the Gódávari river, the Chief Engineer for Irrigation suggested that it would be of very great advantage if gauges could be set up at Chanda and Sironcha and the readings telegraphed to Dowlaishweram at intervals whenever the river was above the level which experience might show to correspond with important floods at the latter place. At the suggestion of the Board, the Meteorological Reporter to the Government of India has been asked to take the necessary steps for carrying out the suggestions made by the Chief Engineer.

22. The only meteorological work with which this department is directly concerned is the reporting and tabulation of the rainfall recorded at 403 stations in different parts of the Presidency. The tabulation is entrusted to the Meteorological Reporter to

the Government of Madras, who duly published the usual tables during the year. At the close of the year, the post was transferred to Imperial control, but no change is proposed in the arrangements for tabulating the rainfall records.

V.—SCIENTIFIC AND LOCAL INQUIRY UNDER PROVINCIAL DIRECTION.

23. With reference to the general question of agricultural enquiry and the starting of agricultural farms referred to in the eight resolutions of the Government of India, the duties of the agricultural department have been summarised under the following heads :—

(1) the collection and arrangement of facts and statistics bearing on all branches of economics and agriculture ;

(2) the investigation of agricultural defects brought to light by an examination of the land records and the devising of remedies therefor ; and

(3) the investigation of local agricultural practices and the conduct of experiments on problems suggested thereby.

24. For the proper carrying on of the statistical work above referred to, and for bringing to notice and investigating facts which may be gleaned from a study of the statistics, it has been suggested that the services of one officer might with advantage be employed, and that it is advisable that this officer should be the Deputy Director of Agriculture, this post being separated from that of Deputy Director of Land Records and the latter post not being revived. It would then be the duty of the Deputy Director of Agriculture, subject to the control of the Board of Revenue, to collect, arrange and publish all statistics bearing on agriculture, including rainfall, cultivation, and special crops, prices and wages, irrigation, and trade by land, as well as to prepare therefrom, and from the statistics of the sea-borne trade compiled and issued by the Department of Separate Revenue, reviews and reports in elucidation of economic facts bearing on the condition of the country. The adoption of this measure would be advantageous, since it would to this extent define the position and responsibilities of the Deputy Director in relation to the Board, making him in fact Statistical Reporter for the Presidency.

25. Regarding the second item of the duties of the Agricultural Department, the investigation must, it has been pointed out, be chiefly carried out by the Land Revenue staff, and by the Land Record staff when appointed, though it would be part of the duty of the Deputy Director of Agriculture to ledger observations in regard to and, if possible, to suggest a remedy for, any serious agricultural deterioration which may be reported.

26. In regard to the third item, the matters on which Government called for report were—

(i) the scope and course of enquiry which should be followed;

(ii) the number of experimental farms which will be needed now and in the future, and the programme to be adopted thereat;

(iii) the character of the staff to which these inquiries and farms should be entrusted; and

(iv) the establishments (including European and Native assistants and inspectors) to be worked up to, and the cost of such establishments in the near and distant future.

Regarding the first point, viz., the scope of the inquiry and the method on which investigations should be carried out, it has been suggested that the instructions given need reconsideration with reference to the scheme sketched by the Government of India, and that as Mr. Benson has remarked, it is necessary to distinguish between a general investigation of prominent agricultural defects which may and should be made throughout the country, and the more minute investigations which are the function of an experimental farm. In the former case attention should, from time to time, be concentrated on one prominent defect; in the latter, the working plan may legitimately

include the simultaneous trial of as many experiments as the Director guided by his advisers may determine to be eventually required; experiment being set on foot on the experimental farms for some years before the general investigation may be taken up.

27. A scheme prepared by Mr. Benson, the Deputy Director, has been recommended to Government for acceptance, which is briefly that, as a scheme to be ultimately worked up to, eight experimental farms should be established—four in the northern and four in the southern half of the Presidency—each farm to be about 50 acres in area: the general programme of operations on the farms being that suggested by the Deputy Director. In connection with each farm, a school or class should be established by the Educational Department. The agricultural staff required at each farm will be a resident Inspector who might be designated farm superintendent, and one or more probationers attached to do duty as bailiffs and record-keepers in connection with the experimental work. These latter after they have gained some experience should do duty as inspectors as defined below or as farm superintendents at other farms.

28. For making general inquiries into special agricultural defects, the department should in a great measure rely on the staff of Land Record Deputy Collectors and the Revenue Inspectors. This will be possible to a greater extent in the future, if these officers, have, as is proposed, been through a course of instruction in agriculture. To make some special provision for more fully trained enquirers, the appointment of two Sub-Assistant Directors of Agriculture, on the scale of pay of Deputy Collectors, and the placing under them of four inspectors has been suggested.

29. As a programme for immediate operations, it has been suggested that very early steps should, if funds can be provided, be taken to establish two experimental farms—one in the northern and the other in the southern half of the Presidency.

It has also been suggested that another European agricultural expert should be engaged before the end of the coming official year.

30. During the year under report three Agricultural Inspectors were engaged in collecting detailed information and specimens regarding the sorghum crops—*vide* paragraph 17. The Sub-Assistant Director, who was employed in the Board's office owing to the famine was set free about November last, and has since been engaged in supervising the work of the Inspectors. The remaining Inspector has been employed at head-quarters in arranging and sorting the samples of sorghum sent in and in compiling a classified index of all the reports and papers in the departmental library.

31. *The College Farm and Botanical Gardens, Saidapet.*—A separate detailed report regarding the working of the above has been submitted by the Principal of the College of Agriculture. The farm is maintained for educational purposes and not for profit or experiment. Dairy farming is the chief work done on the farm.

32. *Barley shows.*—The report alluded to in paragraph 35 of the report for the previous year was received towards the end of the year. At a show held in September 1898, out of eight exhibits only two fulfilled the conditions as to quantity (viz.), that each should be not less than a bushel. To these the first and second prizes of Rs. 30 and 20 were awarded. The third prize of Rs. 15 was withheld. As the barley is grown especially for brewing, it has been arranged that at least one of the judges should be experienced in brewing.

33. *Ground-nuts.*—Towards the end of March 1898, the Chairman of the Chamber of Commerce, Madras, drew attention to the marked decrease in the exports of ground-nuts from this Presidency during the last two years and suggested that in view of the importance of the crop the Government might with advantage follow the example set by the French Administration in sending for seed ground-nuts from Africa for local distribution and sale; the theory advanced being that the falling off was due to the deterioration of the seed. A consideration of the facts of the case, however, showed that this was improbable and that considering the manner in which the crop has been grown, the falling off was not to be wondered at and that the importation of new seed was likely to give only very temporary relief. The Government, however, decided that it was desirable to import a supply of new seed of the best oil-yielding varieties from Africa and also to endeavour to secure varieties from America and Japan. Arrangements

have been made since the close of the year with the Chamber of Commerce for importing eight tons of seeds, four of which were to be of East African sorts, and four from Mozambique. Some East African seed has been received and is being distributed for sale.

34. *Carrots.*—The reports of the officers and others who conducted the experiments with the carrot seeds obtained in 1897 from the Agricultural Department, North-Western Provinces, show that the seed was generally sown from December or January to May or June and the crop was harvested three months later; but the results were generally scarcely worth recording.

35. *Sugarcane.*—The inquiries regarding the disease which had caused so much loss amongst the sugarcane in Gódávari were continued and Dr. Bourne was directed to revisit the district and to report whether the preventive measures recommended by him had been adopted and whether the fungus appeared to be gaining ground or to be disappearing. Dr. Bourne was accompanied by the Deputy Director, Mr. Benson. The result of the examination of the canes showed that the disease is the *Trichosphœria sacchari*. Dr. Bourne was of opinion that there were no signs of improvement and that the disease had spread more widely. He suggested that the ryots should observe the following precautions :—

(1) not to ratoon the crop when there has been any disease in a garden; on the other hand to burn all the litter, and to dig up the roots after cutting and to burn them; (2) not to attempt to grow cane on the same plot for two years; (3) in new plantings, to take care to secure healthy tops from a healthy locality; (4) to remove and burn young plants if they show signs of disease; (5) and to crush and burn diseased canes as soon as the disease appears.

36. This report of Dr. Bourne was forwarded by Government to the newly-appointed Government Botanist for remarks in view of the experience he had gained of sugarcane diseases in the West Indies. That officer reported that he was of opinion that though the Rind fungus *Trichosphœria sacchari* was to be found on the canes in this Presidency, yet the appearance of red spots and areas in the tissues should not be regarded as diagnostic of its presence, because in canes affected by any vegetable or animal parasites one of the first signs of ill-health was the appearance of red spots. He added that there might be many other fungi attacking the cane besides *Trichosphœria* and from Dr. Bourne's description he considered that the *Colletotrichum falcatum* was present among the canes as well as the *Trichosphœria sacchari*. The subject is still under correspondence; but the Director of the Botanical Survey of India has reported that canes sent to him both from Gódávari and Ganjám appear to be attacked by forms of the polymorphous *Trichosphœria sacchari*, Mass. The discussions regarding this fungus, however, appear to be involved in a great deal of doubt.

37. *Sisal Hemp.*—Early in the year, the Honorary Secretary of the Agri-Horticultural Society, Madras, informed Government that upwards of 3,000 plants of the *Agave rigida var Sissalana* were available and that the committee thought it desirable that these plants should be tried on various soils in the drier parts of the Presidency. The plant was reported to be a valuable fibre plant which produces the *Sisal hemp* of commerce. The offer of the committee was accepted and arrangements were made to distribute the plants to the Collectors of Bellary, Anantapur, Cuddapah, North Arcot, Nellore, Salem, Coimbatore and Madura with instructions as to the proper method of planting and treating the crop.

38. *The Madras Agri-Horticultural Society.*—The income of the society by the sale of plants, seeds and sundries amounted to Rs. 3,644 during the year, and a sum of Rs. 1,714 was also collected by way of subscriptions from members. The loan of plants realized a sum of Rs. 350 and tickets to the value of Rs. 930 were sold during the last flower show. Besides the above income a grant of Rs. 4,000 was made by Government. The usual flower show was held in February last and was successful. An addition of 37 books and periodicals were made to the library. Seeds and plants were also exchanged. The Director of the Department of Land Records and Agriculture was, as usual, an *ex-officio* member of the Managing Committee.

39. *Veterinary Science—Pony and mule breeding operations.*—During the year under report nine pony and one donkey stallions worked in Coimbatore and four pony and two donkey stallions in Salem. The average number of coverings per pony stallion was 44 in Coimbatore and 27 in Salem against 41 and 42, respectively, in the previous year. The short work in Salem was ascribed to the prevalence of plague. Out of 362 mares covered during 1897–98 in Coimbatore, the results in the case of 73 mares were unknown; of the rest 56 foaled and 214 or 74 per cent. of the known results were empty. In Salem out of 185 coverings, the results of 70 were unknown; 27 foaled and 75 or 65 per cent. of the known results were empty. The percentage of foals to mares covered during the year was 19·7 in Coimbatore and 23·5 in Salem against 29·0 and 37·0, respectively, in 1896–97. The attention of the Superintendent, Civil Veterinary Department, was drawn to this deterioration in the results of the coverings and he has been requested to submit a report as to its cause and to the method of improving the same. The results of the work of the donkey stallions were equally unsatisfactory.

The total number of castrations was 21 in Coimbatore and 266 in Salem. The small number in Coimbatore is due to the absence of the salustri on leave for a long period.

Only one pony show was held, at Tirupur in June 1898. The number of exhibits was satisfactory and good in quality. The show at Berikai, which should have been held in January was abandoned on account of plague.

40. The Cattle Disease Act (Act II of 1866) was put into force at 16 places during the year in connection with large cattle fairs, and at all of them a Stock Inspector was present to assist in working the Act. There were no prosecutions under the Act. The Stock Inspectors also attended four other fairs, and five weekly markets where the Act was not enforced.

41. *Statistics.*—The following returns were published in connection with local inquiries under provincial direction:—

(1) Special forecasts on the outturn of ground-nuts and sugarcane in February.
(2) Report on the operations of the establishments for stamping weights and measures—submitted to Government, Revenue Department, on 1st July.
(3) Comparative statement of irrigation and rainfall—forwarded to the Chief Engineer for Irrigation in October.
(4) Statement of quantity and value of crops irrigated under major (productive) works and minor works for which capital and revenue accounts are kept.
(5) Triennial report on the subject of agricultural wages, embodied in the Land Revenue administration report—submitted to Government in March.
(6) Season reports in three sections (rainfall, cultivation and prices of food-grains and salt)—monthly.
(7) Quarterly and annual reports of cattle mortality.

VI.—AGRICULTURAL EDUCATION.

42. The question how the principles laid down by the Government of India as to reform in primary education, the improvement of readers and text-books, and the training of teachers, so as to provide men competent to give instruction in elementary agriculture, may best be given effect to was considered in consultation with the Director of Public Instruction during the year, as well as the following specific questions:—

(1) What, if any, further action is necessary to enable agricultural degrees, diplomas or certificates to be placed on the same footing as corresponding literary or science degrees, &c., in qualifying for admission to Government appointments, particularly those connected with Land Revenue administration.

(2) What appointments should be included in the category of those for which the agricultural diploma should be eventually compulsory.

(3) How the practical instruction in agriculture of candidates for certain subordinate appointments at a school-class or an experimental farm could best be arranged for.

(4) How a special school course leading up to the agricultural diploma, degree, or certificate could be provided.

(5) Whether the scheme of a Government farm could be arranged so as to provide for schoolmasters passing through a course of a few months' instruction either before or after appointment.

43. In regard to primary education, the Government of India laid down three principles, viz. :—

(i) That elementary science should not be taught as a separate subject, but in school readers illustrated by object lessons.

(ii) That some plan under which instruction in village maps and land records, and instruction in simple commercial accounts could be given should be included in the curriculum of education for schools of all classes.

(iii) That it should be considered at what stage "agriculture" and the sciences ancillary thereto should be made optional subjects of the school curriculum.

44. (*a*) In regard to the first point, it was pointed out that in this Presidency under the system at present in force, all lessons given in primary schools that refer to natural objects must be illustrated by the object referred to, either as a model or by specimens. New readers have, in most standards, been issued for use in primary schools, and these contain a number of lessons on natural objects.

(*b*) As to the second point raised, it was pointed out that instruction in village maps and land records is of too specialized a character to be suitable for inclusion in the curriculum of primary schools. In the present curriculum, simple household accounts and bazaar bills are already included under a compulsory subject—arithmetic—for the fourth standard in primary schools.

(*c*) It was stated with reference to the third recommendation of the Government of India that already the optional subject—elementary science—is included in the curriculum for all standards from the infant to the fourth, and that this forms an introduction to the study of agriculture and the sciences ancillary thereto; in these standards the subject is taught by object lessons. From the fourth to the sixth standard specially-prepared text-books have been introduced, and in the seventh standard the scheme of study is controlled by the technical examination scheme.

It will thus be seen that, in this Presidency, the principles laid down by the Government of India have, for the most part, already been adopted.

45. Regarding readers and text-books dealing with agriculture and allied sciences it was pointed out that the objects of bringing them up not only to an equally high standard of arrangement, clearness and simplicity throughout India, but also to the best standards in Europe, have been and are held in view.

46. As to the advisability of instructing schoolmasters how to teach by means of object lessons and readers and to develop training schools in this direction, it was stated that for the training of teachers in giving object lessons, elementary science, which is specially taught thereby, has recently been prescribed as one of the two optional subjects that must be taught in the practising section of all Government training schools, and thus the teachers become familiar with the method of giving object lessons. It would, no doubt, be advisable to attach to each district training school a school garden or farm, and this should be done wherever it is possible. It has been recommended that, after a certain lapse of time, one at least of the teachers in each normal school should be a trained agriculturist who holds the agricultural diploma and has been regularly trained in the method of teaching. This measure, whilst improving the teaching staff of these schools, would, in time, improve the subordinate inspecting agency also by introducing into it a number of men whose education had been partially agricultural, and thus make them better qualified for inspecting the rural primary schools.

47. Diploma-holders, for whose training alone provision exists at present, are already placed on an equal footing with graduates, so far as admission to the Land Revenue Department is concerned, as they are now permitted to appear for the Revenue and Criminal Higher Special Tests. If the measure of reserving one post of teacher at each district training school advocated above be accepted, the value of the diploma will increase.

It was also suggested that eventually the possession of the diploma in agriculture should be made compulsory for Land Record Deputy Collectors and Head Revenue Inspectors, if appointed; and also for—

Native Assistants to the Director of Agriculture,
Agricultural Inspectors and Farm Superintendents,
Supervisors, Assistant and Deputy Commissioners in the Settlement Department,
Teachers of Agriculture for classes of the Intermediate standard,

and that, if a course working up to an intermediate group certificate be provided, such certificate may ultimately be demanded from candidates for the post of Stock Inspector and also from a proportion of the candidates for the post of Revenue Inspector.

48. *Higher Education.*—This is carried on at the College of Agriculture, which is administered by the Educational Department in consultation with the Director on all matters of importance. In 1898–99, there were 46 students on the rolls of the college at the end of the year against 49 in the previous year; more than a fourth of these came from outside the Presidency—eight from Bombay and five from Mysore and Coorg. The Agricultural Chemist delivered the usual course of lectures and held practical classes for a period of one month. It is now proposed to secure a larger share of his time for work in the College of Agriculture seeing that the number of students at Saidapet is larger than at Poona. Owing to the reversion to Military duty of Mr. Edwards, Superintendent, Civil Veterinary Department, the college was deprived of the usual lectures delivered by him. The post of Vice-Principal was not filled up during the year.

The system of "field cultivation" which was substituted for "plot cultivation" in 1897–98 at the suggestion of the Principal is stated to have worked well; but the students did not take so much interest in it as they did in "plot cultivation." The working of the system is being watched further. The veterinary hospital continued to increase in popularity, and the number of cases treated has risen from 380 in 1895–96 to 602 in 1897–98 and 724 in 1898–99 though the scale of fees was slightly raised during the past year.

As already observed the position of the Diploma-holders has been improved by placing them on an equal footing with graduates so far as employment in the Revenue Department is concerned.

49. *Educational qualifications prescribed for the Land Record Staff—*

Karnams (village accountants) must pass—

(1) the Primary School Examination; this includes—

(i) three compulsory subjects, viz., (*a*) Language (the vernacular language of the candidate),—(*b*) Handwriting and Spelling, and (*c*) Arithmetic;

(ii) at least two optional subjects, viz., (*a*) Elementary Science, or (*b*) Geography, or (*c*) English or another Second Language, or (*d*) Indian History, or (*e*) Drawing, or (*f*) Hygiene, or (*g*) Agriculture, or (*h*) Mensuration.

(2) the Village Officers' Special Test in (*a*) the Manual of Village Accounts, (*b*) Powers and Duties of Village officers.

Candidates for the office of karnam must also produce "good" certificates from the Survey schools.

These rules do not apply to village officers who may have been in office on 1st July 1898, nor to their heirs registered before 1st January 1896, who were 18 or above on the 1st of January 1896. The rules though passed some years ago only came into force from 1st July 1898, and in future no person will be appointed to the office of karnam who has not qualified according to the tests mentioned above, unless specially exempted by the Collector for reasons to be recorded by that officer.

Government has also decided that arithmetic up to the sixth standard should be added to the list of optional subjects for the Primary Examination and that future candidates for the post of village accountant (karnams) should be required to pass in arithmetic and mensuration as their optional subjects in that examination. The latter question has been dealt with by the Land Revenue Department. The former was transferred to the Educational Department.

50. The extent to which the educational system of the Presidency meets the requirements mentioned above is as follows:—

Boys are taught up to the Primary School Examination (Standard IV) in the fourth class of schools. Karnams are trained in surveying at special schools held for the purpose. The Village Manuals of Accounts and the Village Officers' Manual have been published in the vernacular languages.

51. The educational qualifications required of Revenue (Circle) Inspectors are that they should have at least passed the Lower Secondary Examination in the first class or the University Matriculation Examination with English, Handwriting, and Dictation and the Revenue Test, lower grade, of which test the village and taluk accounts form a part, and should obtain a certificate in surveying. Persons who have only passed the Lower Secondary Examination in the first class will hereafter not be elgible to appear for the Revenue Test, lower grade. The Matriculation Examination, with the Handwriting and Dictation Tests, or the Upper Secondary Examination should, at least, have been passed.

VII.—THE PUBLICATION OF AGRICULTURAL INFORMATION.

52. No special publications of agricultural information were made by the Department during the year. A monograph on "woollen fabrics" was prepared by Mr. Thurston, Superintendent, Central Museum, and submitted to Government during the year. To the same officer was entrusted the preparation of a monograph on "silk fabrics" for the year 1898.

53. The number of papers received from and communicated to other provincial departments was as follows:—

Subject.	Received.			Sent.		
	Books.	Other papers.	Total.	Books.	Other papers.	Total.
Agriculture	86	13	99	..	18	18
Statistics .. Crop	99	..	99	..	15	15
Statistics .. Trade	94	106	200	5	98	103
Famine	3	..	3	..	..	..
Forest	25	..	25	..	..	..
Survey	8	..	8	..	..	..
Arts and Industries	50	..	50	1	..	1
Botany	2	40	42	..	40	40
Entomology	2	..	2	..	..	..
Geology and minerals	5	..	5	..	..	..
Meteorology	16	3	19	..	3	3
Live-stock (Veterinary science) ..	13	..	13	..	..	..
Miscellaneous	4	..	4	..	..	..
Total ..	407	162	569	6	174	180

Besides the above, 330 journals, bulletins, and the like were also received from Agricultural societies and institutions in other countries.

Resolution—Mis. No. 4214, dated 25th August 1899.

The Board begs to submit herewith its report on the operations of the Department of Land Records and Agriculture for the year ending 31st March 1899.

(True Extract.)

(Signed) C. BENSON
Deputy Director
for Secretary.

To the Secretary to Government, Revenue Department, with a report.

Order—No. 741, Revenue, dated 3rd November 1899.

Miscellaneous.

With the above memorandum the Board submits its report on the operations of the Department of Land Records and Agriculture during the year 1898–99.

2. Schemes were elaborated during the year for the constitution of a Land Records staff and for expanding the operations of the Agricultural Branch of the department, in particular by establishing experimental farms. These schemes present many difficulties, but the Government hopes that it will be possible to make material progress towards their solution in the course of the current year.

In the meantime, the present organisation of the department necessarily limits its operations in great measure to the collection of statistics and to isolated special investigations.

3. His Excellency the Governor in Council recognizes, however, that much useful work was done during the year. Some of the results attained will be briefly noticed under the various heads of the report.

(i) *Land Records establishment.*—Substantial improvements in the condition and status of the subordinate ranks were carried out. The pay of karnams was materially increased in thirteen districts. Sanction of the Secretary of State was received to the scheme for the improvement of the taluk establishments. Higher qualifications in Surveying were prescribed for Revenue Inspectors. At the same time the prospects of this useful class of officers were bettered by the issue of orders, directing that men recommended for the post of Deputy Tahsildars should, as a rule, have served as Revenue Inspectors for some time and that no man who has not undergone at least a year's training as Revenue Inspector should be appointed to any place in the districts carrying a salary of Rs. 35 or upwards.

(ii) *The utilization of land records.*—Much time and labour appear to have been spent in maintaining the village registers and firka books up to date. The report however is silent as to whether any practical advantage or useful information was derived from the examination of these records.

(iii) *Scientific and National enquiry under Imperial direction.*—Experiments with Salem iron ore were not encouraging. A private firm, however, has since opened negotiations with the object of exploiting the ore.

In the field of Botany the systematic survey of the Presidency, in abeyance since the death of Mr. Lawson, was resumed by Mr. C. A. Barber.

The work of the Veterinary Department has been separately noticed. It furnished no result of importance.

At the close of the year all meteorological work other than the recording of rainfall was taken wholly under Imperial control.

(iv) *Scientific and local enquiry under provincial direction.*—Attention was directed during the year more particularly to *ground-nuts* and *sugar-cane*. The demand in Europe for the former appears to have decreased of recent years, whether on account of the discovery of a cheaper substitute, or on account of a decline in the quality of the nut due to bad farming or to deteriorated seed. The Government awaits with interest the result of the experiment of importing new seed from East Africa and Mozambique.

Enquiries commenced by Dr. Bourne, F.R.S., and pursued by Mr. Barber tended to show that canes in this Presidency were in many places attacked by the fungus, *Trichosphœria Sacchari, Mass.* Enquiries are still in progress, but the result so far seems to be that the remedy lies largely in the hands of the ryots and consists in isolating and destroying all diseased canes and in importing for propagation healthy "tops" from non-affected tracts.

(v) *Agricultural Education.*—A review of the subject showed that the principles laid down in the sixth of the Agricultural Resolutions of the Government of India are generally recognized and acted on in this Presidency. Further action is possibly required in the direction of instructing schoolmasters how to teach by means of object lessons and readers and of developing training schools for this purpose. The matter is under the consideration of the Government.

(vi) *Publication of Agricultural information.*—No special publications were issued by the department during the year.

(True Extract.)

(Signed) H. TREMENHEERE,
Ag. Secretary to Government.

To the Board of Revenue (R.S., L.R. and Agri.).
„ Educational Department.

Endorsement No. 741A.

Copy to the Government of India, Department of Revenue and Agriculture.

(Signed) N. E. MARJORIBANKS,
Ag. Under Secretary to Government.

Exd. P. Seetharam.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1899-1900.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1900.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR

1899-1900.

I.—PREFATORY.

Mr. A. W. B. Higgens was in charge of the Department until the end of November 1899 when the Hon'ble Mr. F. A. Nicholson, C.I.E., was appointed Director. He took charge of the Department in the first week of December 1899. Mr. C. Benson, the Deputy Director, discharged his duties without interruption throughout the year. He was in charge of the office of the Superintendent, Civil Veterinary Department, from the beginning of the year till 1st July when he handed over charge to Veterinary-Lieutenant J. D. E. Holmes, who continued in that office throughout the remainder of the year. Mr. Benson was also in charge of the office of the Secretary to the Commissioner of Revenue Settlement and Director of the Department from the 9th May to 15th August and again from 25th September to 5th November, during which periods the permanent Secretary was employed on other duty. Owing to the grave failure in the rainfall and crops of the past season, much of the work of the department from the first week in December, has dealt with a scarcity which appeared likely to develop into famine.

II.—LAND RECORDS ESTABLISHMENTS.

2. As regards the organisation of a Land Records staff, a detailed and exhaustive report, prepared in consultation with the Superintendent, Revenue Survey, was submitted to Government. In this report the creation of a special Land Records staff in each district was fully dealt with and proposals for the necessary staff were made. The question whether it is necessary or advisable to revive the separate post of Deputy Director of Land Records was also considered in this connection, and the conclusion that it was unnecessary to do so was arrived at, since it had been found from experience that the appointment was practically of little use and that the object could be better effected by the appointment of special Deputy Collectors in each district, subject to the general control of the Collectors and the Board of Revenue with some occasional assistance from the Survey Superintendent. The orders of Government on this report are still awaited but have been delayed owing to the large amount of regular survey work which has been found to be required.

3. Regarding the prospects of promotion to be offered to Revenue Inspectors, it has been decided that no rules are necessary for reserving a certain proportion of the higher appointments to them, but orders have been issued to the effect that men recommended for the post of Deputy Tahsildar should have, as a rule, served as

Revenue Inspectors for some time and that no man who has not undergone at least a year's training as Revenue Inspector should be appointed to any post in the districts carrying a salary of Rs. 35 or upwards; this will ensure that the post of Revenue Inspector is made a stepping stone to higher posts in a majority of cases.

4. As stated in the previous year's report, the question of improving the course of survey training for Revenue Inspectors was under discussion, as the Superintendent of Surveys considered that the course prescribed, which only included about a fortnight's training in a Karnam's Survey school, was insufficient. A further term of practical training for one month with a survey party was accordingly prescribed during the year, and it was ruled that no one who has not secured a "good" certificate in a karnam's school or obtained a survey certificate from the Civil Engineering College or an intermediate certificate in surveying in the Government Technical Examinations should be appointed as an acting Revenue Inspector; and that no one should be confirmed as a Revenue Inspector, who had not, in addition, undergone a month's practical training with a survey party, and obtained from the Survey officer in charge a "good" or a "pass" certificate. With a view to providing for the upkeep of the survey in all respects and for conducting small special surveys of an intricate nature, it was also ruled that two or three Revenue Inspectors in each district should be trained in theodolite surveying, the men to be specially selected for their aptitude in survey work and specially trained by further deputation for work in a survey party for three months, after which period they should, if qualified, be given a certificate of proficiency in surveying. Detailed rules for the one month's and three months' courses referred to above have been issued since the close of the year.

5. The sanction of the Secretary of State for the improvement of the position of the taluk establishments has been received and was given effect to from 1st July 1899.

6. In the year under review, schemes for the revision of village establishments were sanctioned by Government for the Tanjore and Trichinopoly districts and for nine out of the eleven taluks of the Kistna district; but effect was given to the revision only in the first-named district and in one taluk of the Kistna district. The introduction of the revised scheme in the Trichinopoly district has been deferred till 1st October 1900. The schemes for all the taluks in the Kistna district have been sanctioned; but they are held in abeyance in those taluks where an increase of expenditure is expected, as compared with the cost of the existing establishments, since the sanction of the Secretary of State is necessary for the increased cost of the establishments. The revised scale of salaries for karnams sanctioned by the Secretary of State has been extended to the Tanjore district and one taluk of the Kistna district, where the revision of village establishments was carried out during the year as already stated.

7. The system of holding annual survey schools for the training of karnams was somewhat modified during the year. Instead of holding a single school in each taluk, two schools were held, the first for a period of 15 days at which only those karnams whose qualifications in survey had been found to be "indifferent" or "bad" at the schools previously held, were trained, together with new candidates and the second, for five days (from the 5th to 9th December 1899, throughout the Presidency), at which all karnams, including those previously trained and certified as good or fair, were required to attend. At these latter schools the Tahsildar and Revenue Inspectors inspected the karnams' field-measurement books, and permanent progress registers and prepared statements giving the following information:—

(1) Survey qualifications of karnams.
(2) State of karnams' survey instruments.
(3) Progress of preparation of field-measurement books.
(4) Number of sub-divisions to be measured and plotted, and amount of work finished.
(5) Number of demarcation stones missing and the number replaced.

A written examination was held on the last day of these schools to determine the qualifications of the karnams. The results of these schools have as yet been only partially reported.

8. During nearly the whole period from April to December, the Deputy Director was detained at Madras by Secretariat work and for four months and nineteen days of this period he was called upon to officiate as Secretary to the Director. In September he visited South Arcot in order to arrange for some manuring experiments with ground-nuts, and Coimbatore to inspect the sugar-cane crops growing around there, which were reported to be diseased. In the early part of February 1900, the Deputy Director went to Dhone in Kurnool to preside over a committee appointed to discuss questions connected with the rules and forms for the administration of weavers' relief. A report was submitted embodying the suggestion of the committee. Having been appointed Member and Secretary to a Committee to discuss famine forms and finance, the Deputy Director was engaged on that work during the remainder of the month. Later he visited the Gódávari delta to make arrangements for introducing Hospet cane amongst the ryots.

9. The village and taluk accounts in all the districts of the Presidency were, as usual, examined at the annual settlement. Collectors report that the village accounts are generally maintained in a fairly satisfactory condition, but that there is still room for improvement in the maintenance of taluk accounts. It was reported, however, that the village and taluk permanent B. registers, which are important records of inams, were not properly maintained in the Kistna district. The registers are now being checked and brought up to date by a temporary establishment. In Chingleput, the examination of the village accounts of Madurántakam taluk is reported to have been confined to account No. 6 and the attention of the Divisional-officer concerned was drawn to this omission. Steps are being taken by Collectors to secure better results in the current year.

10. *The use made of the Land Records staff in connection with famine-relief.*—In the year under review extensive loss of crops occurred in Kistna, the Deccan districts and Nellore, and as was pointed out in previous reports, it is the duty of the Land Record staff at all times to collect information and to report on water-supplies, the progress of cultivation, the condition of the standing and the outturn of the harvested crops, and the healthy condition of the people and of their cattle. In such a season as the last, the inspection of the tracts affected becomes of more importance with a view to granting remissions or postponements of revenue, and consequently the work of the Land Record staff was increased. The services of the staff were also largely utilised in making the necessary inquiries for the grant of State loans which the ryots were encouraged to take both for executing land improvements and to enable them to purchase fodder for their cattle.

Relief operations in no case extended beyond the test-work stage.

11. Regarding the more effective use of the Land Record registers as evidence of rights and titles, there is nothing new to report.

III.—THE UTILIZATION OF LAND RECORDS.

12. *Village Statistical Registers and Firka Books.*—Reports regarding the manner in which these records, which are now regarded as part of the taluk and village accounts, are maintained, have not been received from all districts, but the information available is tabulated below. This shows that the village registers and the firka books have been written up and checked completely up to fasli 1308 in Ganjám, Vizagapatam, North Arcot and the Nilgiris and the village registers alone in Kurnool and almost completed up to that year in Tanjore, Trichinopoly, Coimbatore, Chingleput and Nellore. In Bellary, South Arcot and Salem, the village registers of one or two villages only have to be posted for fasli 1308, but firka books for the same year have to be prepared and checked for a larger number of villages. In Madura, the preparation and checking of these registers for 51 Government villages and 149 inam villages have not been completed for fasli 1307, while in South Arcot, the village register for one village was neither prepared nor checked for the same year. In the former district, the Collector reports that special attention is being paid to the completion of registers in the Government villages, but that the work in inam villages cannot be done by the present staff of karnams as they are inefficient and that the work must be put off till the village establishment in whole inam villages is organized under Act II of 1894. In

South Arcot, it is reported that the register for the village in question is missing. In the remaining districts the Collectors concerned have taken the necessary steps for bringing the records up to date. The progress for fasli 1309 has been small except in Bellary and Coimbatore. In Nellore, the village registers of two-thirds of the villages have been prepared and checked. In the remaining districts, there was no considerable progress. The following table shows in one view the progress made in the several districts in the preparation, &c., of these records.

Districts.	Number of villages in the district	Number of villages for which.							
		Village registers remain to be		Firka books remain to be		Village registers are		Firka books are	
		Prepared	Checked	Prepared	Checked	Prepared	Checked	Prepared	Checked
		Up to fasli 1308.				For fasli 1309.			
Ganjám	1,531	..	..	..	..	246	188	120	..
Vizagapatam	282	..	..	..	..	122	77	77	77
Gódávari	1,462	78	129	78	129	..	..	..	..
Kistna	..	..	..	..	..	..	..	..	..
Kurnool	789	..	..	52	109	382	272	174	43
Bellary	962	1	1	266	451	675	568	261	160
Anantapur	740	59	59	59	59	..	..	..	..
Cuddapah	..	..	..	..	..	..	..	..	..
Nellore	931	17	17	19	19	634	507	..	..
Chingleput	1,782	2	16	2	16	..	..	..	..
South Arcot	2,700	* 1 † 2	* 1 † 2	12	365	..	..	..	..
North Arcot	1,767	..	..	..	..	928	805	654	442
Salem	3,051	2	2	160	160	..	..	..	..
Coimbatore	1,509	8	8	8	8	1,145	989	574	473
Trichinopoly	731	1	1	1	1	118	39	118	39
Tanjore	2,537	14	14	14	66	1,831	595	475	133
Madura	938	* 200 † 301	* 200 † 304	* 200 † 301	* 207 † 498	..	..	..	..
Tinnevelly	1,081	59	59	156	226	..	..	..	..
Nilgiris	48	..	..	..	..	..	..	..	..

* Fasli 1307. † Fasli 1308.

IV.—SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL DIRECTION.

13. *Geology.*—During the year under review Mr. F. H. Smith was at work for five months, during which time he reconnoitered the whole of Ganjám district, except a small tract to the extreme south round Chicacole and Parlákimedi which had already been mapped by the late Mr. Fedden. The country is not very promising from an economic point of view and *mica* would seem to be the only mineral of possible value. Mr. Smith had several pits sunk on the mica outcrops in the neighbourhood of Russellkonda with the result that crystals of somewhat crushed and earthy mica were obtained up to 5 inches in diameter. Quartz reefs are practically absent throughout the district. Quartzose bands occur amongst the schists, but Mr. Smith was unable to find any trace of gold in them. None of the natives of Ganjám carry on gold washing, and traces of the metal were met with in one place only, namely, on the Mahendragiri mountain.

Dr. T. L. Walker surveyed parts of Vizagapatam where he found that iron is manufactured in many villages but the ores are generally poor.

A proposal to export quantities of Salem iron ore to Sweden to test its capabilities by the magnetic process of concentration fell through, the Secretary of State having ruled that the results of the trials of Bengal coal which were being carried on in England should be awaited before any such steps are taken.

No reports were received intimating corrections to be made in the Provisional Index of Minerals.

14. *Botany.*—Mr. C. A. Barber occupied the post of Government Botanist throughout the year, his head-quarters being at Ootacamund. He is assisted by a small staff for the augmentation of which proposals have recently been made and approved. As pointed out in paragraph 16 of last year's report, the chief aim of his work is to make a systematic survey of the flora of the Presidency. His advice is also available on subjects connected with economic botany, whilst, under recent orders, questions regarding cryptogamic plants are to be referred to him for opinion and advice. The tentative programme drawn up for his guidance not having met with the approval of the Government of India, the Government Botanist has been requested to draw up a revised programme for his future work in the light of the suggestions made by, and in consultation with, the Director of the Botanical Survey of India, in order that his work may be co-ordinated to the requirements of that department. A report on the work performed by him during the thirteen months from 1st June 1899 to 30th June 1900 is appended.

During the official year now under reference, the Government Botanist was on tour for 7 months and 8 days in the districts of Tinnevelly, Coimbatore, South Arcot, Gódávari, Ganjám and Vizagapatam. While on tour about five months were spent in collecting specimens and the rest in economic work. More than 2,000 plants have been collected and added to the herbarium.

He also undertook to name plants for the Mysore Government, keeping the specimens in the herbarium in exchange for the names sent. This arrangement appears to be good in the interests of the Botanical Survey of India.

The principal subjects of economic work dealt with by the Government Botanist are referred to in part V of this report.

15. The work of collecting specimens of the articles included in the " programme of collections to be made for the Indian Museum and Imperial Institute " was proceeded with during the year. A large number of specimens of sorghum have already been furnished to the Reporter on Economic Products by the Deputy Director.

During the year, Dr. Watt, the Reporter on Economic Products to the Government of India, paid an official visit to this presidency, with a view to acquiring commercial exhibits for the new Economic Gallery of the Indian Museum, Calcutta. He visited Madras, Pondicherry, Cuddalore, Tanjore, Negapatam, Tuticorin, Coimbatore, and Calicut. It is not known what collections he made while in this Presidency.

16. *Chemistry.*—During the period that Dr. Leather was attached to the College of Agriculture, he analysed ten samples of cows' milk of the Saidapet herd and the results obtained are shown in the table below :—

The composition of ten samples of cows' milk of the Saidapet herd.

Particulars.	Bhagyum II.	Govindi.	Parvati.	Meenakshi II.	Poongan.	Meenakshi III.	Tara II.	Average milk of herd on		
								29th March 1900.	4th April 1900.	7th April 1900.
Specific gravity at 15·5°c.	1033	1,030 ·5	1,032· 5	1,032 ·1	1,034· 4	1,033	..	1,033· 7	1,031· 9	1,032· 2
Water	86·14	85·52	84·48	86·13	86·98	86·08	86·79	86·27	86·89	85·97
Butter fat	4·41	5·48	5·07	4·57	3·52	4·62	4 ·44	4·00	4·14	4·68
Proteids	3·23	3·14	3·27	3·44	3·27	3·25	3·10	3·15	3·16	3·23
Sugar fat	5·05	4·68	4·66	4·56	4·96	5·05	4·70	4·82	4·81	4·92
Mineral matter	0·76	0·70	0·72	0·77	0·72	0·77	0·69	0·76	0·74	0·72
Total ..	99·59	99·52	99·20	99·47	99·45	99·77	99·72	99·00	99·74	99·52

It will be seen that the composition of the milk of this herd coincides closely with that of European cows' milk.

17. *Statistics.*—The subjoined statement shows the statistics furnished to the Government of India and the Imperial officers under the control of that Government:—

Name of report.	To whom sent.	When due.
Weekly Season report	Government of India (Revenue and Agriculture).	Every Tuesday.
Annual Programme of famine-relief works (Famine Statement C).		1st June.
Do. List of agricultural implements and machines tested and found successful.		15th November.
Do. Statement of collieries	Government of India (Finance and Commerce).	20th February.
Do. Statement of minerals	Reporter on Economic Products.	15th April.
Half-yearly statement of wages of agricultural labourers, &c., per mensem.	Government of India (Finance and Commerce).	25th January and July.
Outturn report on late sowings of gingelly	The Director-General of Statistics.	15th April.
First forecast of sowings of cotton		15th August.
Forecast of early sowings of gingelly		15th ,,
,, of sowings of indigo		15th September.
Second forecast of sowings of cotton		10th October.
Forecast of sowings of paddy		15th ,,
,, of outturn on the early sowings of gingelly		15th ,,
First outturn report on cotton		10th December.
,, ,, on paddy		15th ,,
Outturn report on indigo		15th ,,
Forecast of the late sowings of gingelly		1st January.
Second outturn report on cotton		10th February.
,, ,, on paddy		15th ,,
Statistics of cinchona cultivation		1st July.
Rail-borne trade and road traffic return, annual		1st October.
Quarterly Returns of rail-borne trade		1st January. April, July and October.
Returns of agricultural statistics		1st November.
Statement of cotton and hemp mills		15th June.
,, of paper and woollen mills		1st April.
Statistics of tea and coffee cultivation		1st July.
Fortnightly returns of wholesale and retail prices of certain commodities at selected marts.		10th and 25th of each month.

As the agricultural statistics for the year have not yet been compiled it is not possible to compare the estimates of area framed in the forecasts with the actual areas sown.

18. In the middle of December 1899, Mr. J. E. O'Conor, C.I.E., Director-General of Statistics, visited Madras for the purpose of expounding to the local authorities the principles which should govern the collection and compilation of statistics forming part of an imperial statistical system. The chief points at issue were: (1) change of meaning of certain expressions used in the Sea-borne trade returns; (2) a proposal to change to the calendar from the official year the period treated in the statistics of cotton mills; (3) whether quantitative estimates of the yield of certain crops are of any use or value. In the middle of June last, the Director-General forwarded a memorandum stating the general lines he wished to be followed, in which he alluded to several other questions that had been settled before. In this memorandum he enunciated five principles which should be observed by the Provincial Statistical officers, viz., (1) that the local statistics must be collected and compiled in such a way as to suit the general scheme for the whole of British India and to ensure the completeness thereof; (2) that the forms and classifications prescribed for local statistics should on no account be modified without the sanction of the Government of India through the Director-General; (3) that statistics, though of minor importance in one or more provinces, should nevertheless be furnished, as otherwise the Imperial statistics will be incomplete; (4) that difficulties which may stand in the way of obtaining accurate data should not deter attempts being made to improve existing data; and (5) that when new statistics are required, there should be no hesitation in endeavouring to arrange for the supply.

19. *Veterinary Science.*—The system of working the Bacteriological Survey was slightly modified by concentrating the Stock Inspectors in two or three districts. The survey has been completed in two taluks of Salem, seven taluks of Coimbatore, and two in Tinnevelly. The Superintendent considers that the work done in this respect

since 1896 is of little or no value, the reports being merely a collection of unreliable statistics furnished by villagers regarding the outbreaks of contagious diseases in the villages visited. The work was begun at the instance of the Government of India and carried out on lines suggested by the Assistant Inspector-General, Civil Veterinary Department, and it appears that, in view of Mr. Holmes' report, the work should cease forthwith and the establishments, which were retained solely for this purpose, should be dispensed with. Proposals to this effect are before Government. Certain outbreaks of cattle disease in Madura, Coimbatore and Travancore were also investigated by Stock Inspectors and by the Superintendent, Civil Veterinary Department.

Experiments in inoculation with serum prepared at the Maktesar laboratory were tried as a protection against rinderpest on the hills in Travancore and 339 head of cattle were inoculated with results that go to show the value of this method, which would prove of great value if accepted by the ryots. Reports from the Punjab and North-Western Provinces show that cattle owners are voluntarily applying to have their cattle immunised, and the Superintendent has been directed to continue the experiments in the plains.

The question whether there is any opening or necessity for a veterinary school at Madras or for veterinary dispensaries at mofussil stations, as proposed by the Inspector-General, was discussed during the year and the orders of Government are awaited. A donation of Rs. 10,000 was offered by a Native gentleman of Madras to assist in founding a veterinary college, but the donation was so circumscribed by conditions that it is doubtful whether it can be accepted by Government should the idea of opening a veterinary school in Madras be accepted.

20. *Meteorology.*—The question of establishing a system of flood warnings on the Gódávari was continued during the year, but it was pointed out by the Meteorological Reporter to the Government of India, with reference to the stations first suggested by the Chief Engineer for Irrigation as those at which gauges might be set up, viz., Chanda and Sironcha in the Central Provinces, that in 1896 the severest flood at the Gódávari anicut followed moderate rainfall in the eastern districts of the Central Provinces, while very heavy rainfall in the western districts was followed at the anicut by a flood of much less severity, and that the above two stations are not suitable for the purpose. It was, however, suggested that a gauge at Sironcha and another lower down below the junction of the Indravati would be useful. It was also suggested that the flood readings at those points might be correlated with the records of rainfall received from the catchment areas above, but until these stations can be connected with the telegraph system, nothing further can be done and the proposal is for the present abandoned.

As in previous years the tabulation of the rainfall registered at the rain-gauge stations was performed and published by the Meteorological Reporter to the Government of Madras. The total number of stations for which rainfall statistics have been published is 431 including those in the Native States of Pudukkóttai, Travancore, Cochin and Coorg.

21. *Entomology.*—The work of identifying insects is undertaken by the authorities of the Indian Museum, Calcutta. During the year the larvæ of a moth (probably *Heliothis armigera*) were found destroying the paddy seedlings in the Chingleput and Tanjore districts. As a means of destroying them, the villagers dried some of the seed beds by cutting off the water, and this, owing to the heat of the sun, destroyed them effectually. The villagers were, it was reported, "joyful with the belief that the insects have been found by long experience to be the forerunners of heavy flood, and that they made their appearance some twenty years ago and were followed by heavy flood." In the Coimbatore district certain larvæ were found which were damaging the tender sugarcane. The pest was identified, as being probably the *Diatræa saccharalis*, the sugarcane borer moth, which also attacks cholam (*Andropogon sorghum*) and maize (*Zea mays*). Some insects which were destroying the sugarcane crops in the Chandragiri taluk of the North Arcot district were identified as *Dictyophora pallida* (Lantern flies). In South Arcot, it was found that the larvæ of a moth belonging to the family Arctiidæ were destroying the ground-nut crop near Panruti.

V.—SCIENTIFIC AND LOCAL INQUIRY UNDER PROVINCIAL DIRECTION.

22. The proposals mentioned in paragraphs 23 to 29 of the last report, on the general question of agricultural enquiry and the starting of farms still await the orders of Government.

23. *Agricultural Inspectors.*—During the early months of the year two Inspectors continued at the work of collecting information regarding the sorghum crops of the Presidency, regarding which a large mass of information has been collected and is being prepared for publication. During the remainder of the year these two, and for some months a third Inspector, were engaged in collecting information regarding the cultivation of sugarcane and paddy in certain localities, and one of them for a short time in looking after the planting of Hospet cane in Gódávari—*vide* paragraph 29. The fourth Inspector was employed at head-quarters until he was deputed for duty at the Agricultural College. The Sub-Assistant Director was employed in supervising the field work of the Inspectors and in collecting and reducing to shape the results of their own and his enquiries. He also accompanied the Government Botanist during his tour of enquiry regarding sugarcane diseases in the Gódávari and Ganjám districts.

24. *The College Farm and Botanical Gardens, Saidapet.*—A separate detailed report regarding the working of these has been submitted by the Principal of the College of Agriculture. The farm is maintained for educational purposes and not for profit or experiment. Dairy farming is the chief work done on the farm. Some interesting experiments were made for the department on the growth of imported varieties of ground-nut, but they were on too small a scale for the results to be of much value. Seeds obtained from America, Japan and Africa were sown, and the experiment will be repeated.

25. *Barley shows.*—A show was held at Ootacamund on the 20th May 1899. There were only three exhibits which appeared to have been kept so long as to be worthless and the prizes were therefore not awarded. The Collector of Nilgiris also reported that the Nilgiri Agri-Horticultural Society decided not to hold a second show during the year, as, owing to unpropitious weather, the barley crop had almost entirely failed.

26. *Ground-nuts.*—It having been decided to import a supply of new seed of the best oil-yielding varieties from Africa, arrangements were made with the Chamber of Commerce for the purchase of eight tons of seed—four from East Africa and four from Mozambique, but the Chamber was not able to obtain seed of the latter variety. The four East African varieties received were distributed to the Collectors of North Arcot, South Arcot, Chingleput, Tanjore, Trichinopoly for sale to the ryots of their districts at the price of ordinary seed, and a small quantity was reserved for experiment on the College farm at Saidapet. No reports have been received from the Collectors regarding the outturn realised and they have been requested to submit a report thereon. The results obtained at Saidapet are noted above.

With a view to determine the effect of phosphates, lime, and nitrogenous manures on the yield of this crop, a series of experiments was arranged for near Panruti in South Arcot, but, chiefly owing to the late date at which only it was possible to apply the manures, no useful results were obtained. Experiments with Basic slag and Trichinopoly phosphates were also made on the Agricultural College Farm, Saidapet, but these also failed owing to bad germination of the seed sown. These experiments will be taken up again during the current year.

Samples of ground-nuts were collected from several districts and forwarded to the Agricultural Chemist to the Government of India for analysis and a report showing the results of his analysis has been received since the close of the year and will shortly be published in the form of a bulletin.

The Government Botanist during the course of his tour in South Arcot inspected a number of ground-nutfields near Panruti and submitted an interesting report on the result of his investigations which has been published.

27. *Seoni seed-wheat.*—In 1898, 200 lb. of seoni seed-wheat were obtained from the Central Provinces and distributed to the Collectors of Salem, Madura and Nilgiris for experimental cultivation. All three Collectors reported that the crop did not generally thrive and the outturn realised was poor. The failure of the crop was attributed to the untimely season when the seed was sown. The Collectors of Madura and Nilgiris, therefore, requested the Board to obtain a further supply of 150 lb. before the 15th March 1900 to be sent to them for sowing early in April. The seed was, however, obtained from the Central Provinces only in the beginning of April and distributed to the Collectors of Nilgiris and Madura—two-thirds to the former and one-third to the latter. The results of these further experiments are awaited.

28. *Sugarcane.*—The Government Botanist was deputed to inspect the cane fields in parts of the Bellary, Trichinopoly, and Coimbatore districts, with a view to determining whether the disease attributed to the *Tricho-sphœria sacchari*, which had been causing so much damage in the Gódávari district, existed there also. He reported that the canes he saw at Hospet in Bellary and near Trichinopoly were apparently free from this pest, but that near Coimbatore the white cane was suffering from the attacks of the *Colleto-trichum falcatum*, the exact relation of which to the *Tricho-sphœria sacchari* appears to be a matter for dispute amongst scientific authorities. Mr. Barber also reported that near Coimbatore he found the canes suffering from a disease resembling the *sereh* of Java and pointed out the dangerous character of that disease. Subsequent enquiries, however, showed that the disease alluded to (*shuleh-kattai*) is of long standing, but not of a serious nature in ordinary seasons.

Later on in the year Mr. Barber reported on the cane fields in South Arcot, and found that a form of smut existed there in some cases. His report on this pest has been published.

He also in December last visited Gódávari and after an inspection of the cane-fields of the eastern delta confirmed the reports previously submitted by Dr. A. G. Bourne, F.R.S., as to the cause of the injury to the crop there. He however came to the conclusion that the fungus causing the injury should be described as *Colleto-trichum falcatum* and not *Tricho-sphœria sacchari*. Mr. Barber's principal recommendation as a means of combating the pest was to provide the ryots with healthy seed-cane and he reported that the introduction of seed-cane from Peddapuram at Vulapalle, mentioned by Dr. Bourne last year, has been continued with good results. He therefore urged the establishment of Government nurseries to grow and sell seed-cane to the ryots. The Government Botanist also reported that the same disease exists in Ganjám but is kept greatly in check there by the peculiar system of propagation followed. His report on these tours is in course of publication.

29. During the year, arrangements were made, with the approval of Government for the importation and sale to the ryots in the Gódávari delta of fresh and healthy canes from Hospet. Eight tons of seed-cane were purchased and transferred to Gódávari and there sold amongst 13 ryots at the price of the ordrinary seed-cane produced in the locality. The results, as reported by the Deputy Director, Land Records and Agriculture, are, so far as can be judged at present, not altogether satisfactory, and Mr. Benson is inclined to attribute this to the local practice in regard to planting. He believes that it may be advisable to revert to the original plan proposed, viz., to hire some land in Gódávari for two or three years and plant it with seed of immune canes from Hospet or elsewhere and work it departmentally, which it was not possible to do last year.

30. *Sisal hemp.*—As was pointed out in paragraph 37 of last year's report, the offer of the Madras Agri-Horticultural Society to place 3,000 plants of the *Agave rigida var sisalana* at the disposal of the department was accepted and the plants were distributed to the Collectors of Bellary, Anantapur, Cuddapah, North Arcot, Nellore, Salem, Coimbatore and Madura with instructions as to the proper method of planting and treating the crop. The reports received from the Collectors are, on the whole, not very encouraging. Of the plants distributed to the Collectors of Bellary, Anantapur, Salem and North Arcot, the major portion is reported to be thriving. The Collectors of these districts will be requested to watch the progress of the plants and submit a

further report regarding their condition and growth at the end of the current year. The reports from the other Collectors are very discouraging as almost all the plants sent to them are said to have died.

Applications were made by two Europeans as representatives of capital for large areas of waste land with a view to planting this fibre on a large scale and establishing factories for working up the fibre for market. The applications were favourably considered and easy terms granted by way of cowle (B.P. Mis. No. 920, dated 26th February 1900), but, so far, nothing seems to have been done. Considering the abundance of waste land in the Ceded Districts, &c., assessed at about As. 4 per acre, the ease with which the plant is elsewhere grown and prepared, the power which it is said to possess of resisting extreme drought, and the demand for good fibre at very paying rates, it is remarkable that capitalists, especially those of the country, do not take up this venture in which the department is ready to assist in every reasonable way.

31. *The Madras Agri-Horticultural Society.*—The income of the society by the sale of plants, seeds and sundries amounted to Rs. 4,411 during the year, while the collections by way of subscriptions from members amounted to Rs. 2,012. Besides these principal items of income a grant of Rs. 4,000 was made to the society by Government. The flower show, held on the 25th February, was, on the whole, a success. An addition of 52 books and periodicals was made to the library. Seeds and plants were also exchanged.

32. *Veterinary Science—Pony and mule breeding operations.*—During the year under review fifteen pony stallions were at work, nine in Coimbatore, five in Salem and one in Madura. The average number of coverings per stallion was 39 in Coimbatore and 20 in Salem as against 44 and 27 respectively in the previous year. The short work is attributed by the present Superintendent, Civil Veterinary Department, to the increasing unpopularity of the Government sires owing to the poor results of previous coverings and also to a defective system of management. The stallions are, he states, regarded as poor stock getters and in some cases disliked by owners on account of bad "hair marks." Out of 394 mares covered during 1898–99 in Coimbatore, the results in the case of 62 mares were unknown; of the rest, 76 foaled and 241 or 73 per cent. of the covered mares traced were empty. In Salem out of 109 coverings, the results, of 31 were unknown, 16 mares foaled and 59, or 76 per cent. of the known results were empty. The percentage of foals to mares covered during the year was 19·0 in Coimbatore and 15·0 in Salem, as against 19·7 and 23·5 respectively in the previous year. During the year the Superintendent, Civil Veterinery Department, submitted a series of reports with reference to the large falling off in the results of coverings and the cause thereof and dealt with the method of improving the results. His reports described the condition of the stallions, stables, &c., in each district, and offered explanations for the large percentage of unsuccessful coverings and suggested remedies. The remedies suggested were—

(1) To appoint a salustry at each station where a stallion is kept, who should be in charge and supervise coverings and check results in addition to attending to castration work.

(2) To make the Deputy Superintendent's work more effective.

He proposed to increase the staff of salustries to twelve, employing seven in Coimbatore, four in Salem and one in Madura, to give them six months' training under himself or his deputy at one of the breeding centres or at a Veterinary College, if one be established in Madras, and to offer a pay of Rs. 10 per mensem at the time of engagement which should rise to Rs. 25. These proposals have been generally approved by Government, but the method in which they should be worked out is under discussion.

In Coimbatore, 56 entires were castrated as against 21 in the previous year. In Salem 121 entires were castrated as against 266 in last year. The increase in Coimbatore is satisfactory, but there is still much work to be done in this direction. The decrease in the number of castrations in Salem is said to be due to the prevalence of plague.

No pony shows were held during the year owing to the prevalence of plague.

33. The Cattle Disease Act (Act II of 1866) was put into force at 20 places during the year in connection with large cattle fairs at each of which a Stock Inspector was present to assist the Revenue officers in carrying out the provisions of the Act and to treat cases of disease. There were no prosecutions under the Act and few cases of contageous diseases were recorded as having occurred at those fairs.

34. *Statistics.*—The following returns were published in connection with local inquiries under provincial direction :—

(1) Special forecasts on the outturn of ground-nuts and sugarcane in January.

(2) Report on the operations of the establishments for stamping weights and measures—submitted to Government, Revenue Department, on 1st July.

(3) Comparative statement of irrigation and rainfall—forwarded to the Chief Engineer for Irrigation in October.

(4) Statement of quantity and value of crops irrigated under major (productive) works and minor works for which capital and revenue accounts are kept.

(5) Triennial report on the subject of agricultural wages, embodied in the Land Revenue administration report—submitted to Government in March.

(6) Season reports in three sections (rainfall, cultivation and prices of food-grains and salt)—monthly.

(7) Quarterly and annual reports of cattle mortality.

35. *Paris exhibition.*—A number of photographs, &c., illustrative of Agriculture has been sent by the Department to the Paris exhibition of 1900.

VI.—AGRICULTURAL EDUCATION.

36. Recommendations on the method by which effect may be given to the principles laid down by the Government of India as to reform in primary education, the improvement of readers, the preparation of text-books, and the training of teachers so as to provide men competent to give instruction in elementary Agriculture, were under the consideration of Government during the year, but orders thereon are still awaited.

37. *Higher education.*—This is carried on at the College of Agriculture, which is administered by the Educational department, in consultation with the Director on all matters of importance. In 1899–1900 there were 47 students on the rolls as against 46 in the previous year. Eleven of these students came from Bombay, Mysore and Coorg.

Mr. Thorne, who had been selected by the Secretary of State for the post of Vice-Principal of the College, joined his appointment on 25th June 1899. He was placed in charge of the College when the Principal went on furlough, from the 27th July following. That this was necessary is to be regretted, as the preliminary work of a newly-arrived Agricultural officer should be to make a close and intimate study of the agricultural conditions and practices of the country in which he is to work; before he can be competent to teach, he must of necessity study in the field Indian agriculture, Indian conditions, and Indian limitations. It is hoped that this matter will not be lost sight of when Mr. Keess returns to duty. Amongst the other changes in the College staff during the year under review, M.R.Ry. R. Ramaswami Aiyar, one of the Agricultural Inspectors attached to this Department, was deputed to act as the Fourth Assistant for four months towards the end of the year.

The Assistant Agricultural Chemist delivered his usual course of lectures for two months during the year from 15th February to 14th April, and held practical classes during the same period. It has been since decided, in deference to the demands of the Government of Bombay, that Dr. Leather's course shall be restricted to six weeks from 1st March. Considering the claims of this College, both as to standing and the number of Agricultural students under training, this decision is greatly to be regretted.

The usual special course of lectures on veterinary matters was delivered by Veterinary-Lieutenant J. D. E. Holmes, Superintendent, Civil Veterinary Department, between 1st December 1899 and 31st January 1900. He remarked that the students who came before him are both afraid and unwilling to handle animals and showed very little knowledge of the habits and general management of cattle. These facts go to show that their agricultural training was defective. This and other defects have been brought to notice in connection with the recent examinations, and the matter is under discussion with the Director of Public Instruction. The results of these examinations have been very unsatisfactory of late years, and show that the method and course of training requires most careful revision.

Owing to the unfavourable character of the season, the practical work of the students was much disturbed. It is, however, hoped that the current year may afford an opportunity for giving a fair trial to the system of "field cultivation" as distinguished from "plot cultivation."

The Veterinary Hospital continued to increase in popularity and the number of cases treated has risen from 380 in 1895–96 to 724 in 1898–1899 and 804 in 1899–1900.

38. As to the position of the diploma holders and the educational qualifications of the Land Record staff there is nothing new to report.

VII. THE PUBLICATION OF AGRICULTURAL INFORMATION.

39. During the year under report the following agricultural bulletins were published:—

No. 36 "A sugarcane pest in Madras," a collection of papers with notes by Mr. C. Benson;

No. 37 "The ground-nut" (*Arachis Hypogœa.*), a statistical review of the trade with correspondence and notes by Mr. C. Benson;

No. 38 "The ground-nut crops growing near Panruti in South Arcot" by Mr. C. A. Barber, the Government Botanist.

A monograph on "Silk Fabric industry" prepared by Mr. Thurston, Superintendent, Central Museum, was also published during the year. The same officer was entrusted with the preparation of a monograph on "Ivory Carving" for the year 1899-1900.

40. The number of papers received from and communicated to other Provincial departments was as follows:—

Subject.	Received.						Sent.			
	Reports.	Books.	Pamphlets.	Journals.	Other papers.	Total.	Reports.	Pamphlets.	Other papers.	Total.
Agriculture	22	18	275	17	8	340	..	..	11	11
Statistics .. Crop ..	49	..	43	..	6	98	..	..	8	8
Statistics .. Trade ..	95	..	..	..	52	147	5	..	39	44
Famine	3	..	..	..	1	4	..	..	1	1
Forest	8	..	..	7	..	15	..	..	..	..
Survey	5	..	12	..	1	18	..	..	..	..
Arts and Industries ..	..	..	..	50	4	54	..	1	9	10
Botany	6	..	..	..	..	6	..	..	..	..
Entomology	..	..	3	..	..	3	..	..	..	..
Geology and Minerals ..	4	..	..	..	..	4	..	..	..	..
Meteorology	9	..	17	..	1	27	..	..	4	4
Live-stock (Veterinary Science)	12	..	..	48	2	62	..	..	1	1
Total ..	213	18	350	122	75	778	5	1	73	79

APPENDIX I.

ANNUAL REPORT of Mr. C. A BARBER, Government Botanist.

I have the honour to forward the following annual report of the work done by the department. The period included is from June 1st, 1899, to May 31st, 1900.

2. The following were my movements:—

On the 1st of June I ascended the hills in Tinnevelly as far as the forest bungalow at *Kannikatti*, and there made a collection of plants in the evergreen forest.

I then worked down to the Karyar river and made a halt at *Kattalaimalai* (June 12—17). Here I also collected a number of plants and inspected the coffee estates.

The next halt was at *Mundanthorai* where the evergreen and deciduous forests were examined (June 17—27).

I then proceeded down the Tambraparni river to Ambásamudram and Palamcottah, and spent a few days in getting the collections into order (June 27—July 6).

After this I visited Nazareth and spent five days in studying the flora of the curious red desert called *Kudiraimalai Teri* (July 7—14). After this my Tinnevelly tour came to an end and I reached Ootacamund on July 16.

Other arrangements having been made for the Director of the Cinchona Plantations, who had been occupying the late Mr. Lawson's office, herbarium and laboratory, I was able to take possession on July 23. My work at head office consisted in preparing the estimates for furnishing and altering the office.

I spent about a week over the Tinnevelly collections, prepared a report on the literature of Trichosphæria sacchari and Colletotrichum falcatum, examined some fibre plants sent for identification from Vizagapatam and reported on some bundles of diseased sorghum plants sent from Nellore.

On August 16 I left Ootacamund for Podanur, where I spent four days in the study of the Coimbatore sugarcanes.

I then proceeded to *Cuddalore*, where I collected the sea-side flora and made preparations for the coming South Arcot tour. I also visited the sugarcanes at Nellikuppam, which were suffering from a borer attack caused by drought (August 22—31).

The first place visited was *Shanikulam* near Gingee, where a large collection was made of the plants of the mixed forests reserved there (September 4—13).

At Melpat, on the Tenmalai hills, 3,000 feet above sea level, a larger number of plants was gathered together, the forests showing a greater proportion of evergreen and hill plants (September 19—28).

I then marched to Tiruvannámalai, whence the specimens collected on tour were sent to Ootacamund by train. Unfortunately these specimens met with wet weather *en route* and were considerably damaged. After this experience I have always sent dried plants by passenger train in charge of an attendant.

The first half of October was spent in examining the ground-nuts of Panruti and the sugarcanes of Tiruvannanallúr.

I arrived at head office on October 16, and at once continued the preparation of the herbarium buildings. Most of the recess was spent in other than scientific work. I was turned out for the greater part of November to make room for the workmen, and, as there was no furniture during the remainder of my stay, the work was carried on under difficulties.

I spent about a fortnight in examining the plants so far collected, reported on some diseased Sorghum plants from Dindigul, prepared my report on ground-nuts and devoted some time to the study of the literature of the sugarcane diseases, in view of my approaching visit to Gódávari. I also had the pleasure of receiving a visit from the Reporter on Economic Products with whom I inspected some tea estates.

On December 1, I again left head office, this time for three months.

My first week was spent at Madras in consultation with the Board.

After that I visited the sugarcane fields in the Rámachandrapuram taluk of the Gódávari district, where I found the fields infested to a terrible extent with red smut (December 9—19).

The remainder of the time till January 16 was spent in examining the canes in the Ganjám district, and in writing my report on the disease met with in the fields.

On January 18 I joined the Agent's camp and accompanied him on his annual tour through the *Ganjám Hill Agency tracts*.

This tour was confined to the parts nearer to the plains, as will be seen from the list of places visited—Russellkonda, Ramba, Udayagiri (Goomsur), Tickaballi, Linepada (within a mile of the northernmost limit of the Presidency), Koinjur, Kusadardi, Raikia, Digi, Simonbadi, Daringabadi, Dasingabadi, Magudi, Bhaminigam, Damadua, Odaba, Mohana, Loagudi, Pudamari, Digupudi and Berhampur. We arrived at the latter place on February 18, but no collecting was possible after the 13th because all my staff and servants were down with fever.

I visited Samalkot (February 22—24) and examined the canes in the Peddápuram taluk of Gódávari and also some of the fields which I had visited on my previous stay in the district.

After two days in Madras, during which I interviewed Dr. Leather and the Board, I reached Ootacamund on March 1.

The office had been furnished during my absence and now for the first time were the books of the library accessible. But there were great arrears of general office work, and most of the month of March was occupied in getting my budget spent. I was able to devote about a week to the study of the South Arcot and Tinnevelly collections, but as most of my staff were continuously down with fever, I was not able to make much impression upon the accumulations before the Easter holidays.

Immediately after these I proceeded to Waltair (which I reached on April 22) to collect over the Vizagapatam forests. Under the circumstances, much as I would have liked it, I was quite unable to attempt the more enticing higher agency tracts, but because of the condition of my staff I had to confine myself to the lower, hot hills of the Golgonda taluk. I collected at the following places in the Vizagapatam district:—

Pollavaram on the sea coast (April 26—30).

Ragupalem in the dry scrub forest near the railway (May 2—10).

Karaka on the fine slopes of Karakakonda (May 12—21).

Krishnadevipeta just within the agency tracts (May 22 to June 2).

The remainder of this tour should come in next year's report, but I record it for the sake of completeness—

Nathavaram (June 2—12).

Krishnapuram again within the agency (June 10—18).

After this I devoted myself entirely to the study of date-palms and examined them wherever I could on my return eastwards. They were inspected at Lakshmipuram near Narasapatanam, Makarapalem and around Anakapille and Kondakerla. I reached Ootacamund on July 4.

Thus during the thirteen months referred to, four were spent at head office and nine on tour. While on tour, about six months were spent in collecting and the rest in economic work.

It is evident from the previous remarks that an ominous pile of survey work was gradually accumulating at head office. This will be referred to later.

The collections made during the year have been large. The districts visited may be divided up as follows:—

(1) *Evergreen forests.—Kannikatti*, on the Western Ghauts of Tinnevelly, 2,000—3,000 feet, June 2—11.

(2) *Deciduous forests.—Mundanthorai* (in part) on the lower slopes of the same hills, and *Kattalaimalai* (in part) a few miles further up, 600—700 feet, June 12—27—

Ganjám Agency tracts, 2,000—3,000 feet, January 18 and February 13.

(3) *Mixed forests.—Mundanthorai* and *Kattalaimalai* again (in part)—

Shanikulam, South Arcot, on the plains, September 4—13.

Melpat, South Arcot Hills, 3,000 feet, where the admixture of evergreen plants was greater, September 19—28.

Ragupalem, Vizagapatam, on the plains, May 2—10.

Karaka and *Krishnadevipeta*, Vizagapatam, among the low hills bordering the agency tracts, 300—500 feet, May 12—31.

(4) *Desert flora.—Kudiraimalai Teri*, near the coast to the south of Tuticorin, July 7—14.

(5) *Sea-side flora.—Cuddalore* in South Arcot, August 22—31.

Pollavaram, Vizagapatam, April 26—30.

3. From this it will be seen that a great variety of country has been collected over during the year.

As regards the character of the plants obtained it is perhaps premature to say much. But enough has been done to show that valuable additions have been made both to the herbarium and to our knowledge of the plants of the Presidency.

The best results, as far as the collection of new plants is concerned, have probably been obtained from the short visit to Kannikatti and the tour in Ganjám.

The former visit was made in daily torrents of rain in early June, and it is very desirable that a second visit should be paid at another time of the year. As might be expected in a place so near to Ceylon, several plants of the island were met with which had not previously been recorded for Southern India.

The distance from Kannikatti to Ganjám cannot be far short of 1,000 miles north and south. In the latter region, the collection was made in the dry part of the year through leafless sâl forests which are peculiarly exclusive in their possession of the soil. Yet at least a dozen plants have been marked as new to the Peninsula, and this is the more striking, because the same ground had been worked over for a much longer period by so competent a botanist as Mr. Gamble. Several plants, besides those referred to above, are represented in the herbarium only by specimens collected by Mr. Gamble and are not mentioned in Hooker's flora as having been found in South India.

With such interesting results from such widely different regions and under such unfavourable circumstances, it seems extremely probable that the fuller exploration of many intermediate tracts will produce results of scientific value.

In the north, all the hill tracts from Ganjám to Gódávari are worthy of continued examination, and this is especially so because they are noted fever regions and have been little explored in the past by botanists.

In the south and west, there are great masses of country, as will be seen from the memorandum lately drawn up by the Director of the Botanical Survey of India, which are practically unexplored and which will afford the occasions for many visits at different times of the year.

4. I have already adverted to the great accumulation of work at head office. The collecting of plants is a matter requiring a certain amount of technical skill, but the incorporation of these with those already in the herbarium is a matter of far greater difficulty. This latter work has, to a large extent, been in abeyance during the past year.

It will be evident that only a comparatively small part of the year has been spent in the collection of plants. No halt has been made for more than ten days and the periods have frequently been less. A good part of the five months spent in this work has been taken up with office matters and travelling.

Yet the numbers of plants collected are already over 2,000, and when ready for the final examination will fill not far less than 6,000 sheets. The work of properly locating and labelling these sheets of prepared specimens is slow at present. A full day's work does not often see more than 25 sheets added to the cases. It is true that this rate will be increased as time goes on and the plants already in the herbarium are worked over. But there are many of the latter which require comment or changing to another cover, and this will, for some time, be the principal care while adding the new sheets.

From these facts it will be seen that some re-arrangement is required as to the amount of time spent by the Government Botanist in the field and at head office. The matter has been represented to the Board of Revenue, and Government has decided that more time shall be spent by the Government Botanist at head office in the future. A good deal of collecting may be done by subordinates under control and the proper place for the Government Botanist is the herbarium.

5. Another matter which should be brought to the attention of the Board is the frequency, especially of late, with which some or all of the staff have been incapacitated for work.

Much of the work of collecting will of necessity be in localities which are not usually regarded as healthy. So far no very malarious districts have been visited, at least at their worst time, and yet the constant attacks of fever among the staff, let alone the servants, has made the work very difficult. It must be remembered that these are not accustomed to the places visited and are therefore much more liable to sickness than the following of the ordinary district officers. At the present moment (July 24) the writer, botanical collector and principal peon are all *hors de combat*, and one peon and three private servants have had to be dismissed, because of sickness during the last few months. Thus the poisoning and gluing on their sheets of the specimens is being done by coolies.

I draw the attention of the Board to the matter in the hope that some means may be hit upon by which the service with the Government Botanist may be made more attractive.

The present staff consists of a herbarium assistant, who has not so far left head office, and a writer, botanical collector and two peons who accompany the tours. A tent lascar has been recently added by Government. The work at head office during tour times is performed by coolies.

While on tour the work of the peons is not that of ordinary ones. They accompany the daily collecting expeditions and are always fully occupied during the rest of the day with drying and changing the plants which have been collected during the last two or three weeks.

Were it not for the assistance of the taluk officers, who usually place a peon at the disposal of the camp to show the way and to procure provisions, and the District Forest-officers who generally instruct the forest guards to attend and lead the search parties, it would not have been possible to conduct the work so well as it has been done.

But these additional, lent, officers cannot be treated as private peons and a good deal of extra work and long hours fall to the lot of the ordinary staff.

The only suggestion which I can make is that the money now spent on office coolies may be diverted and added to, to pay for two more peons who might, if necessary, take tour in turns according to the state of their health.

In any case, considering the importance of his work, I think that the post of chief peon might be converted into that of assistant botanical collector at a rate of Rs. 15 per mensem. He is the only one qualified to take the place of the botanical collector if anything should happen to him, and it would be well always to have a man in training to fill each post as fast as it is vacated. The peons have been changed several times (excepting the chief peon) and on each occasion I have recruited from the coolies being trained at head office.

I do not wish unduly to press this matter upon the Board, but I consider that it is right that they should be placed in possession of the facts.

6. In the majority of cases it is an easy matter to determine the plants collected. This is, of course, largely due to the completion of Hooker's great flora of British India, but also to the fact that the plants first collected belong to the commoner species.

As time goes on, more and more species will be met with to which it is not easy to assign a cover. There are indeed already a number of plants of this character. The correct naming of a plant, in the absence of type specimens, is largely a matter of comparison of the descriptions of different authors. It must be remembered that after all the flora of British India is in many parts of necessity a Prodromus, a foundation on which to build up a perfect flora when sufficient material shall have been collected. And a reference is very frequently required to the description of the original authors of a species.

And for this purpose an efficient library is essential. As will be seen later, the library, while containing a number of very valuable works, is fragmentary.

In the absence of a thoroughly reliable and fully representative library, the herbarium becomes a more important factor in the naming of plants. But, as before mentioned, there are many errors in the covers, and this takes away from the value of the collection as a final referee.

This remark must not be considered to reflect in any way upon the work of the recent Acting Government Botanist. Without his work the confusion would have been far greater, and the alteration of a single specimen from one cover to another frequently requires hours of study.

It is partly to prevent the accumulation of these difficult specimens, from which the "plums" in the shape of new species may be expected to be drawn, that the suggestion has been made for annual visits by the Government Botanist to the head-quarters of the botanical survey. There a splendid library and herbarium may be consulted and the aid of the Director of the Survey invoked in doubtful matters.

The Government has already consented to the principle of such visits and an opportunity will be sought during the next cold weather, when the plants of the Presidency are quiescent.

7. One of the most interesting enquiries during the past year was from the Superintendent of Government Gardens, Mysore, whether we would undertake to name plants collected by him and sent to us. The Government Botanist of the Madras Presidency is in charge of the Botanical Survey of Mysore, Hyderabad and Travancore, besides the parts of the Presidency itself, but no means has at present been suggested by which these rich botanical regions may be visited. It was then with pleasure that I accepted the responsibility of naming the specimens for the Mysore Government. It is obvious that, for the herbarium to be at all complete, it should have representatives from the whole geographical region of Southern India. The specimens thus far received have included about 50 species of grasses from the Kadur hills. These have been retained in the herbarium and the names sent in exchange to Mr. Cameron.

8. The study of grasses is one that should form a prominent part of the work of the department, both on account of their scientific interest and of their economic value. I have accordingly entered into correspondence with the Agrostologist of the United States Department of Agriculture. The grasses of this great country, like those of India, are especially interesting as having representatives adapted to nearly all the conditions of the globe, from the sand-binding species of tropical sea-shores to those forming the verdure of temperate meadows.

The first result of our correspondence has been the receipt of about 180 named sheets of North American grasses. We are now collecting with a view to return this valuable present and, at the same time, to increase our own knowledge of this interesting and difficult group.

The work of naming the grasses has been placed in the hands of my assistant, Mr. K. Hanumantha Rao, B.A., and I am glad to have this opportunity of recording my appreciation of his energy and ability. All the collections pass through his hands as well as my own, and it is hoped in this way to minimise the errors incidental in all large collections.

9. The herbarium at present consists of the following separate collections :—

(1) *The South Indian collection.*—This was received from the care of the Director of the Madras Museum and arrived at Ootacamund on April 5, 1899. The plants at present occupy 14 small cases and two large ones.

(2) *The North Indian collection.*—These were received (together with the smaller sets named below) on March 15, 1900, as soon as a place for them had been prepared. This collection, which occupies four large cases, is of special value in comparing plants not before recorded from South India.

(3) *Mr. Bourdillon's collection.*—This consists of a small but interesting series of plants from Travancore, occupying one large case. These plants are not fully named, and are therefore not yet incorporated among the South Indian plants.

(4) *Mr. Gamble's Forest Museum Herbarium.*—A small set of plants from South India, mounted on paper of a smaller size. This might be usefully sent out to one of the Local Forest Museums which I have suggested to the Board might be formed in different parts of the Presidency. It will first require looking over.

(5) Extra-Indian plants, in one case.

Altogether there are 14 small cases and 11 large ones, received from the Madras Museum, and four large cases have since been added. It is proposed to adhere to the larger size in future and about four more are needed for the specimens already collected.

10. I now turn to the economic work done during the year. This has been made subordinate to that of the survey.

The principle subject dealt with during the year has been the diseases affecting the *sugarcane* plantations. The fields were visited and the plants examined in the following districts :—

Tinnevelly, near Ambásamudram.
Coimbatore, in the neighbourhood of Podanur.
Trichinopoly, near the town of that name.
South Arcot, at Nellikuppam and Tiruvennanallúr, where the canes are grown by the ryots for Messrs. Parry's factories.
Gódávari, in the village of the Ramachandrapuram and Peddápuram taluks.
Ganjám, in the neighbourhood of Berhampur, Aska and Russellkonda.

The Chief diseases noted, besides the ubiquitous borers, were—

(1) A marked attack of *smut*, Ustilago Sacchari, in Tiruvennanallúr, not, I believe, previously recorded for India. The disease mentioned under that name in Watt's Dictionary appears to be different.

(2) *Red smut*, Colletotrichum falcatum, "Het Rood Snot" of Java, in the Ramachandrapuram taluk of Gódávari. This fungus is probably widespread over India. It occurred throughout the whole of the northern districts visited and has been also found by Lieutenant Gage in Bengal. There was no trace of Trichosphæria sacchari mass, met with during these visits. The attack of red smut was very severe in the taluk mentioned, but did not seem to be doing much damage elsewhere. From the comparison of the canes in the Peddápuram and Ramachandrapuram taluks it was considered that the outbreak was largely due to the lack of drainage and æration of the soil. Experiments are being conducted at the Government Botanist's suggestion in the introduction of canes which have not been markedly attacked by the fungus.

It has also been decided to make a series of analyses of the different canes of the Presidency, the Agricultural Chemist to the Government of India having been interested in the matter.

The other suggestions made in the Government Botanist's reports will have to be left to the ryots themselves, unless the Agricultural Department decide upon any simple exhibitions of experimental fields.

Reports on these and other matters connected with sugarcane were submitted from time to time to the Board of Revenue.

11. The *ground-nuts* (*Arachis hypogœa*) around Panruti were rather carefully examined in view of the alleged deterioration of seed.

The time at the disposal of the Government Botanist rendered it impossible to travel over large areas, and this portion of the South Arcot district was selected after consultation with the local authorities.

It was soon found that the kind of ground-nut planted had been completely changed during the last three years, and the "Mauritius" substituted for the less profitable "Country" seed.

Two or three diseases or pests were noted and the various stages in their life-history worked out.

The most serious attack was that of a minute Tineid moth which swarmed on the plants over large areas in countless myriads.

The other pest of importance, in the form of "armies" of hairy caterpillars belonging to two species of *Aloa*, can be fought with comparative ease, but the more dangerous and less tangible Tineid will require careful study and experiment.

A curious dwarf form was frequently met with among the plants, and, as a great loss of pods resulted, it was suggested that a certain set of experiments should be conducted by the Agricultural Department to determine whether this was a definite disease or a varietal form.

There was a marked increase during the year of the area under cultivation in this neighbourhood, which would seem to indicate that the ryots regarded the industry as a profitable one.

The report of the Government Botanist was published in the form of an Agricultural Bulletin.

12. Various parcels of diseased Sorghum (cholam) plants were examined at head office, but although a number of diseases were found upon the specimens forwarded it was not possible to do much in way of detecting the real culprits or offering recommendations for their destruction. The fields were not visited and the specimens forwarded were not collected by a specialist in disease nor sent in a fit condition for examination.

A perusal of the voluminous reports forwarded with some of the parcels did not always help, because the insects referred to in them were not found upon the dried plants.

Specimens of Thrips, Acari, and borer (*Diatræa* probably) were met with on the plants: two kinds of rust and one of smut were found in the tissues: and the grains were attacked by two kinds of weevil and one shot-borer.

13. Among the various smaller economic matters which occupied the attention of the staff might be mentioned several visits paid to the cinchona plantations in company with the Director.

Several real or apparent parasites upon the trees were examined, chief among which might be mentioned a definite attack upon the roots of older trees in certain portions of the plantations by a nematode (eel-worm).

These do not seem to be doing much harm at present, but their abundance is rather disquieting and they should be watched and treated.

I draw especial attention to them because of the recent discovery of eel-worm upon seedling plants in tea estates of the Wynaad, which is regarded by Dr. Watt from an alarmist point of view.

A set of cinchona plants were dried for the Director to be sent to the Calcutta Economic Museum.

14. While in South Arcot a set of the tubers of the two local yams was sent to the Calcutta Gardens, but no news has been heard of their arrival.

15. There has been a certain amount of clashing between the work just described and that of the Botanical Survey of the Presidency.

The former is undoubtedly the legitimate work of a Government Botanist. But, on the other hand, the chief recorded reason for his engagement in the present instance was the "completion" of the Botanical Survey of Southern India.

This work would of itself take many years of interesting labour, and as there appeared to be danger that the survey would be neglected on account of the increasing importance of economic enquiries, the appointment was suggested of an additional assistant, by whose help the staff might carry on the two branches of work simultaneously. This has been approved by Government, and a larger field of usefulness is thus opened up to the department. No appointment has, however, been made at present.

It is quite certain, with the greater attention now being paid to economic botany in all parts of the world, and the increasing keenness of competition in such industries as tea and coffee, that much work of a useful character might be done in the department.

Special officers have within the last few months been appointed to study the tea plantations of Ceylon and Assam, and with a little assistance the Government Botanist would be able to divert much of the information regarding diseases and other matters which is being obtained in these districts for the use of South Indian planters.

It must, however, be remembered that, in this direction, the Madras Presidency is singularly undermanned in comparison with other agricultural communities, and this must be taken note of in judging the work of this department.

There will, however, often arise questions as to the exact nature of a particular pest, and this work can frequently be done in the laboratory of the Government Botanist without sending enquiries to Calcutta or England.

16. As regards the correspondence conducted by the office during the year under review, there has been little opening for either scientific or economic work. Enquiries of various kinds have been received from time to time, but the large amount of purely clerical work, incidental I presume on the opening of a new office, has prevented any great expansion in this direction.

Questions relating to tea and coffee are naturally most frequent, but, as there has not hitherto been any provision made for the Government Botanist to visit and inspect the estates, these interesting and important industries have not received the attention they might have done.

17. The library of the department consists of a number of books formerly in the office of Mr. Lawson, handed over by the Director of the Madras Museum, and a few manuals received from the Director of Cinchona plantations. (See lists appended).

These probably form only a portion of the library of the late Government Botanist. A considerable number of volumes have been retained for the use of the Curator of the Ootacamund Botanical Gardens, but independently of these there are to all appearance a number of important works dispersed.

It is a great pity that some means was not adopted to keep the late Mr. Lawson's library intact, as it probably contained a very complete set of works on Indian Botany. The work of reconstructing it will be gradual and expensive, but it is evident from what has already been said that it will be of little use to have an excellent herbarium (as the Madras one promises to become) unless it is supplemented by a good library.

During the year one or two works have been added, but it will be well to postpone much purchasing of books until the Calcutta library has been consulted.

For works on general botany the Government Botanist is dependent on his private collection. This fortunately includes many valuable works of reference which it will not therefore be necessary at present to purchase.

18. It will be seen from the lists appended that there are practically no volumes dealing with economic botany.

There will have to be considerable purchases if the department is to act as Economic Adviser to the Government. So far, the Government Botanist has been almost entirely dependent on his somewhat fragmentary private collection.

In addition to this, however, the Board has passed on for perusal and return a considerable number of current periodicals. The value of this concession is great, but there is usually not much time to go through them before they have to be returned. It is obvious that their study has to be far less perfunctory than if they could be placed upon the library shelves for reference. In fact it will at once be seen by those accustomed to the use of large libraries that for the purpose of reference it is essential for sets of the more important periodicals to be placed upon the office shelves. They must be constantly at hand and accessible at all times.

19. The only means of obtaining a suitable collection of current economic literature is by the issue of a departmental bulletin. In many ways it is also desirable that there should be this ready means of communication between the office and the public, from whom the Government Botanist is at present cut off.

The Madras Department of Agriculture has published a certain amount of the economic work done during the year, but it is obvious that this does not meet the requirements of the case. The publication of agricultural bulletins does not assist the library of the Government Botanist's office, and most of his work is quite unsuitable for publication in that series.

The bulletins so far published which include the work of the staff are the following :—

Bulletin No. 36.—"A sugarcane pest in Madras."
" " 38.—"The ground-nuts growing near Panruti in South Arcot."

Another number will, it is believed, be devoted to the attack of smut upon the sugarcane already mentioned. But it is not known whether the far more important work on the Gódávari sugarcanes will be included.

APPENDIX II.

List of books transferred to the Government Botanist from the Connemara Public Library, as these formed part of the Government Botanist's library during the tenure of office by the late Mr. Lawson (G.O., No. 102, dated 8th February 1899) :—

1. Annales Botanices Systematicæ, Walpers, 7 volumes.
2. Annals of Botany, volumes 1, 2, 5, 6, 7, 8, 9.
3. Biologia Centrali-Americana, Hemsley, 4 volumes.
4. Botanical Miscellany, Hooker, 3 volumes.
5. British Desmids, Cooke, 1 volume.
6. British Freshwater Algæ, Hassal, 2 volumes.
7. British Freshwater Algæ, Cooke, 2 volumes.
8. Bryologia javanica, Dozy and Molkenboer, 2 volumes.
9. Comparative Anatomy of Phanerogams and Ferns, deBary, 1 volume.
10. Comparative Morphology of Fungi, deBary, 1 volume.
11. Conspectus Florae Europæ, Nyman, 1 volume.
12. Cryptogamia, Hofmeister, 1 volume.
13. Cryptogamic Botany, Bennett & Murray, 1 volume.
14. Enumeratio Plantarum, Kunth, 6 volumes.
15. Ferns of British India, Beddome, 1 volume.
16. Flora Australiensis, Bentham, 7 volumes.
17. Flora Capensis, Harvey & Sonder, 3 volumes (incomplete).
18. Flora de Filippinas, Blanco, 1 volume.
19. Flora Hongkongensis, with Supplement, Bentham, 1 volume.
20. Flora Indica, Burmann, 1 volume.
21. Flora Indica, Roxburgh, 3 volumes.
22. Flora of the British West Indian Islands, Grisebach, 1 volume.
23. Flora of Ceylon, Trimen, 3 volumes and plates (incomplete).
24. Flora of Mauritius & Seychelles, Baker, 1 volume.
25. Flora of New South Wales, Handbook, Moore, 1 volume.
26. Flora of the South United States, Chapman, 1 volume.
27. Flora of Sumatra, Miquel, 1 volume.
28. Flora of Tropical Africa, Oliver, 3 volumes (incomplete).
29. Flora Orientalis, Boissier, 5 volumes & Supplement.
30. Flora Rossica, Ledebour, 4 volumes.
31. Flora Rossica, Pallas, 1 volume.
32. Flora van Nederlandsch Indie, Miquel, 4 volumes.
33. Flora Vitiensis, Seemann, 1 volume.
34. Genera Plantarum, Bentham & Hooker, 3 volumes.
35. Himalayan Botany, Royle, 2 volumes.
36. Icones Plantarum, Beddome, 1 volume.
37. Icones Plantarum, Wight, 5 volumes (incomplete).
38. Icones Plantarum, Hooker, 1st, 2nd, 3rd, 4th series to 1895 (incomplete).
39. Icones Plantarum, Griffith, 3 volumes.
40. Iconum Botanicarum Index, Pritzel, 1 volume.
41. Icones Plantarum Indiæ Oreintalis, Index, Cleghorn, 1 volume.
42. Illustrations of Indigenous Fodder Grasses of North-West India, Duthie, 1 volume.
43. Illustrations of Field & Garden Crops of the North-West Provinces and Oudh, Duthie, 2 volumes.
44. Journal of Botany, and Journal of Botany & Kew Miscellany, Hooker, 17 volumes (incomplete).
45. Journal of the Linnean Society, Botany, Bound volumes 6—24 and 27—29, Unbound volume 30 and two parts of 31, and about 19 odd numbers (incomplete).
46. Laws of Botanical Nomenclature, DeCandolle, 1 volume.
47. Macleay Memorial volume, Description of a new Hakea, von Mueller pamphlet.
48. Medicinal Plants, Bentley and Trimen, 4 volumes.
49. Monographiæ Phanerogamarum, DeCandolle, Parts 1—9 (incomplete).
50. Musci Frondosi Mediti, Dozy and Molkenbœr, 1 volume.
51. A Natural History of Plants, Baillon, 8 volumes (incomplete).
52. Neilgherry Plants, Wight, 2 volumes.
53. Oranges and Lemons of India and Ceylon, Bonnavia, 2 volumes.
54. Palms of British India, Griffith, 1 volume.
55. Plants Indigenous to the Colony of Victoria, von Mueller, 1 volume.
56. Prodromus Florae Peninsularæ Indiæ Orientalis, Wight and Arnott, 1 volume.
57. Prodromus A. P. deCandolle, Nos. 1, 17, 19 volumes.
58. Repertorium Botanices Systematicæ, Walpers, 6 volumes.
59. Synopsis muscorum frondosum, von Mueller, 2 volumes.
60. Synopsis Filicum, Hooker, 1 volume.
61. Thesaurus Capensis, Harvey, 2 volumes.
62. Thesaurus Literaturæ, Botanicæ Pritzel, 1 volume.
63. Thesaurus Zeylanicus, Burmann, 1 volume.

Supplementary lists of books handed over :—

64. Annales des Sciences Naturelles, 22 volumes (incomplete).
65. Plants of the Coromandel Coast, Roxburgh, 3 volumes.
66. Plantæ Asiaticæ Rariores, Wallich, 3 volumes.
67. Notulæ ad Plantas Asiaticas, Griffith, 3 volumes.
68. Bambusaceæ, Munro, 1 volume.

The following of the above-mentioned books were left behind on loan at the Connemara Library as they might be useful to students in Madras: Nos. 2, 5, 6, 7, 9, 13, 64.

APPENDIX III.

List of books received from the Director of Cinchona Plantations.

The following Manuals :—Nilgiris, North Arcot, Malabar Kurnool, Coimbatore, South Canara.

APPENDIX IV.

The following works have been added to the library by purchase or otherwise :—

1. Dictionary of the Economic Products of India, 7 volumes.
2. Hooker's Flora of British India, 7 volumes, 2 copies.
3. Lawrence Asylum Press Almanac, 1900.
4. Flora of Ceylon, Trimen, volumes 4 and 5 with plates (purchased).
5. Do. do. a copy presented by the Ceylon Government.
6. Wight's Illustrations of Indian Botany, 2 volumes (purchased).
7. Beddome's Ferns of Southern India, 1 volume (purchased).
8. The Diseases of Plants, Geo. Massee, 1 volume (purchased).
9. Van Gorkom, Cinchona Culture, 1 volume (purchased).
10. Beddome's Handbook of the Ferns of British India, 1 volume (purchased).
11. Beddome's Flora Sylvatica, 4 volumes, received in exchange for the duplicate copy of Trimen's Flora of Ceylon, parts 4 and 5 from Mr. Proudlock.

APPENDIX V.

The following periodicals are received :—

1. Kew Bulletin (irregularly).
2. Jamaica Bulletin.
3. Agricultural Ledger.
4. Indian Museum Notes (back numbers wanted).
5. Assam Bulletin (one number).
6. Reports from various Agricultural Departments and Experimental Farms in India.

APPENDIX VI.

The Government Botanist receives the following in his private library :—

1. Nature.
2. Journal of the Pharmaceutical Society of Great Britian.
3. Sugarcane.
4. Louisiana Planter.
5. Botanisches Centralblatt.
6. Beihefte z. Bot. Centr.
7. Kew Bulletin.
8. Linnean Society's Publications.
9. Planzenfamilien, Engler and Prantl.
10. Department of Agriculture, U.S.A., various bulletins.

APPENDIX VII.

List of Periodicals received on loan from the Board's library :—

1. Planting opinion.
2. Journal of the Society of Arts.
3. Agricultural Gazette, New South Wales.
4. The Indian Forester.
5. West Indian Bulletin.
6. Journal of the Board of Agriculture, England.
7. Notizblatt d. koenigl. Botanischen Gartens und Museums zu Berlin.
8. The Tropical Agriculturalist.
9. The Indian Agriculturalist.
10. Queensland Agricultural Journal.

Resolution—Mis. No. 4636, dated 8th September 1900.

The Board begs to submit herewith its report on the operations of the Department of Land Records and Agriculture for the year ending 31st March 1900.

(True Extract.)

(Signed) C. BENSON
Deputy Director
for Secretary.

To the Secretary to Government, Revenue Department, with report.

Order—No. 1081, Revenue, dated 25th October 1900.

Miscellaneous.

With its Proceedings read above, the Board of Revenue submits its report on the operations of the Department of Land Records and Agriculture during 1899–1900.

2. *Land Records Establishments.*—The Government was unable, during the year under review, to pass orders on the Board's scheme for the organization of a Special Land Records staff. Immediate decision on this difficult subject would not permit of the introduction of the scheme during the existing financial pressure.

Meantime, the report shows that every effort is being made to increase the efficiency of the existing subordinate staff. Steady progress has been made in the revision of village establishments; the pay of taluk office establishments has been improved; and much attention has been bestowed on the survey training of karnams and Revenue Inspectors.

3. *The utilization of Land Records.*—The preparation and checking of the village registers and firka books were specially backward in Madura. Several districts still had many villages in arrears for fasli 1308; and no serious effort appears to have been made to write up these records for fasli 1309, except in the districts of Tanjore, Coimbatore, North Arcot, Nellore and Bellary, where the task was only partly done. This state of things is unsatisfactory, and the Board should take steps to remedy it. These records cannot answer the purpose for which they are intended unless they are completed and brought up to date.

4. *Scientific and national enquiry under Imperial direction.*—In the field of Geology investigations were made during the year by officers of the Imperial Geological Survey in Ganjám and Vizagapatam, but the economic results are not promising.

In the sphere of Botany, the new incumbent of the post of Government Botanist continued the exploration of the flora of the Presidency. Several problems in economic botany also received his attention. Mr. Barber describes his work in an interesting report which has been separately noticed. In the Department of Veterinary Science the bacteriological survey was continued, but the work done is of doubtful value. Experiments in inoculation with serum as a protection against rinderpest show that the method is of great promise and the experiments are to be continued.

5. *Scientific and local enquiry under Provincial direction.*—As in the case of the Land Records scheme, want of funds has prevented the Government taking any effective action towards developing the agricultural department. The Government hopes however to be able to provide funds during the next financial year to enable a farm to be started on the lines proposed by the Board.

6. In this portion of its report, the Board would more appropriately have noticed the work of the Provincial Civil Veterinary Department. The annual report of this department has been separately reviewed.

7. The Board's report records much useful work accomplished in the various branches of provincial enquiry. The reports on the experiment with the imported *groundnut* seed are awaited with interest. Mr. Barber's investigations in regard to

sugarcane disease point to the conclusion that the remedy lies in improved methods of cultivation; and the Government agrees with Mr. Benson in thinking that good might result from the demonstrational working of a few plots of land by the agricultural department. As the Board remarks, the results of the experiments with *sisal hemp* are so far not very encouraging. The Government fears that experimental cultivation can hardly ever be expected to be successful if conducted by the ordinary revenue establishments. The work requires constant attention and supervision which Revenue officers cannot bestow.

8. *Agricultural Education.*—The Board's recommendations in the matter of agricultural education are under consideration in the Educational Department. The Government notes that the question of the efficiency of the agricultural and veterinary training given at the Saidapet College is receiving attention from the Board and the Director of Public Instruction.

9. *Publication of Agricultural information.*—The important investigations of the year were duly published in bulletin form. The Government would be glad to hear whether the Board has thought it advisable to take any special steps to place the information acquired within the easier reach of the ryots. Publication in the form of an agricultural bulletin in English is hardly calculated sufficiently to attain this object.

The Government would suggest that such information might with advantage be published in the village sheet of the District Gazettes, a few extra copies being put up with every issue sent to a karnam with instructions to distribute them to the leading ryots of his village.

(True Extract.)

(Signed) G. S. FORBES,
Secretary to Government.

To the Board of Revenue (Revenue Settlement, Land Records and Agriculture).
,, the Educational Department.

Endorsement No. 1081A.

Copy to the Government of India, Departments of Revenue and Agriculture.

(Signed) N. E. MARJORIBANKS,
Under Secretary to Government.

Typd. Shaik Karim.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY,

FOR THE OFFICIAL YEAR

1900-1901.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.
1902.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR

1900-1901.

I.—PREFATORY.

The Hon'ble Mr. F. A. Nicholson, C.I.E., was in charge of the department until the end of November 1900 when he proceeded to Calcutta to take his seat in the Legislative Council of the Government of India, and was soon after appointed a member of the Famine Commission. The Hon'ble Mr. H. Bradley was Director for the remainder of the year. Mr. C. Benson, the Deputy Director, was on duty until he proceeded on privilege leave in continuation of the Christmas holidays, and during his absence M.R.Ry. C. K. Subba Rau Avargal, Sub-Assistant Director, was in charge of the Deputy Director's office. Mr. Benson officiated as Secretary to the Commissioner of Revenue Settlement, etc., from 29th May to 21st November 1900 in addition to his ordinary duties whilst the permanent Secretary was employed elsewhere. Veterinary Lieutenant J. D. E. Holmes, A.V.D., continued to be the Superintendent, Civil Veterinary Department, throughout the year. The state of the season almost throughout the year threw on the department a large amount of work connected with questions for the relief of distress as in the preceding year.

II.—LAND RECORDS ESTABLISHMENT.

2. The Hon'ble Mr. Nicholson was on tour in connection with the state of the season in Kistna, Kurnool and Anantapur from 11th July to 7th August, and in Chingleput, North Arcot and Salem from the middle of September to the middle of October. In December 1900, one of the Land Revenue Commissioners went to Cuddapah, under instructions from Government, to report on the question of starting relief for weavers in that district.

3. As shown above, for six months the Deputy Director was detained at Madras on duty as Secretary to the Commissioner, whilst during the remainder of the period he was on duty, he was engaged chiefly on Secretariat work in connection with the state of the season, and the preparation of a report on the effect of the land assessment in Madras called for by the Government of India. During December he visited Gódávari to inspect the trial crops of Hospet cane planted by the ryots, and to enquire into the general state of the cane crop, and Hindúpur to inspect some fibre crop experiments then being started. At the beginning of the Christmas holidays he visited Poona to confer with the Agricultural Chemist to the Government of India regarding the remodelling of the course of training in the College of Agriculture. No special land record

inspections were made during the year, and the question whether it is necessary or advisable to make any provision for such inspection from a central office is still under the consideration of Government in connection with the proposals for the organization of a special Land Records staff of Deputy Collectors in each district, for supervising the maintenance of survey and other land records.

4. Detailed rules for the one month's and three months' courses for the training of Revenue Inspectors in surveying were, as stated in paragraph 4 of the previous year's report, issued during the year under reference. The final results of the general Survey schools for karnams held in 1899–1900 have not yet been received from the Survey Department, as the Superintendent of Surveys is having the results revalued with reference to the efficiency of the karnams in the subjects noted in the margin, a point not noticed when the results were partially reported in the previous year. The Superintendent of Survey, moreover, did not advocate the holding of annual Survey schools for karnams, and suggested that such karnams as it may, from time to time, be found necessary to instruct in surveying, and also candidates for the post of Revenue Inspectors could be trained by the District Surveyors under the supervision of the Tahsildars and that an examination paper could be set, and the answers valued by the nearest Survey officer. This proposal was accepted as a temporary measure pending the receipt of the Superintendent's report on the final results of Survey schools held in December 1899.

Plotting.
Area—computation.

The six Survey divisions into which the Presidency was divided for the maintenance of land records and boundary marks were abolished under the orders of Government from 1st April 1900; and the Survey officers hitherto employed on this work were set free for cadastral and resurvey work, while the District Surveyors were placed directly under the orders of the District Collectors. There were no District Surveyors in the five districts noted in the margin as, with the exception of Madras, Survey Parties were working in these districts. In other districts, the District Surveyors were engaged chiefly in examining the karnams' field measurement books and inspecting their work in connection with the measurement of subdivisions, and the examination of boundary marks; and also in attending to demarcation and sub-division in intricate boundary disputes and other cases specially referred to them by Collectors, such as could not be attended to by the Revenue Inspectors. The following abstract shows details of the work done in some districts :—

1. Kurnool.
2. Nellore.
3. Malabar.
4. South Canara.
5. Madras.

District.	Number of karnams whose work was inspected.	Number of villages inspected.	Number of fields the plotting of which was tested.	Number of sub-divisions tested in field and in plotting.	Number of missing stones inspected.
1	2	3	4	5	6
Anantapur	75	26	6,184	29	525
Chingleput	..	18	2,858	407	11,810
South Arcot	138	149	26,665	834	7,262
Trichinopoly	212	177	197	4,843	14,512
Salem	72	93	645	184	916
Coimbatore	..	..	39,767	812	5
Kistna	11	14	557	..	68
Madura	..	..	1,805	..	593
Vizagapatam	87	218	6,718	9,470	6,900
Tanjore	46	46	709	3,283	198

5. In the Trichinopoly district, the introduction of the revised scheme of village establishments which was to have taken effect from the 1st October 1900 was again put off till the 1st July 1901, in view of the inconvenience which, it was expected, would result from giving effect to the revision before the completion of the work connected with the census and the jamabandi. In the Kistna district schemes for the revision of village establishments were introduced during the year under review in the taluks of Sattenapalle, Narasaraopet, Palnad, Guntúr, Bápatla, Bezwada and Nandigáma.

Madras Act II of 1894 was extended to the larger inam villages in the several districts of the Presidency, and the village establishments in the marginally noted proprietary estates in the Ganjám district were reorganized, in anticipation of the enfranchisement of the village service inams, the newly appointed village officers being paid the full salaries sanctioned by Government *minus* one-twelfth of the assessment of the service inams in their enjoyment.

Nandigáma.	Kallada.
Nangam.	Pedda Kimedi.
Bodagodo.	Chinnakimedi.
Talagam.	

6. *Examination of Village and Taluk Accounts.*—The village and taluk accounts in all the districts of the Presidency were, as usual, carefully examined at the annual settlement. The Collectors' reports show that the village accounts were maintained in a fairly satisfactory condition. Numerous errors were discovered in several taluks of the Chingleput district, but the Collector states that every endeavour is being made to secure accuracy and completeness in the preparation of these accounts. The village permanent register B, which is an important record of inams, was reported to be deficient in some cases, especially in Ganjám and Gódávari, but the Collectors have promised to remedy these defects at an early date. In Kistna, where a temporary establishment was entertained in the previous year for the verification of these registers, the Collector reports that the work was carefully attended to, and he hopes to bring it to a satisfactory conclusion at an early date. The state of the taluk accounts in some districts is reported to be by no means satisfactory. The accounts were not minutely and carefully examined in the Gódávari district, and in North Arcot they were found to be carelessly maintained. It is also reported that the maintenance of taluk permanent inam register B. was neglected in the Berhampur taluk of the Ganjám district. Collectors have taken steps to secure the proper maintenance of these accounts and registers.

7. *The use made of the Land Records staff in connection with Famine-relief.*—As observed in the previous report, the distress in Kistna, Nellore and the Deccan districts continued from the beginning of the year till September, when the operations were closed in all the districts, but later on a portion of Cuddapah district gave cause for anxiety which necessitated the opening of relief measures on a small scale. Relief did not extend beyond the test-work stage. The usual duty of the land record staff in collecting information and reporting on the water-supplies, the progress of cultivation, the condition of the standing and the outturn of the harvested crops, and the health of the people and of their cattle, was systematically carried on, and in such a season as that of the year under report, the inspection of the tracts affected received closer attention than usual with a view to questions of the remission or postponement of land revenue. The necessary inquiries into applications for the grant of State loans, both for land improvements and for purchase of fodder also fall on this establishment

III.—THE UTILIZATION OF LAND RECORDS.

8. *Village Statistical Registers and Firka books.*—Reports regarding the manner in which these records are maintained show that the village registers and firka books have been completely written up and checked up to fasli 1309 in Vizagapatam and Trichinopoly, and almost completed up to that year in Gódávari, Kistna, Nellore, Coimbatore, Kurnool, Anantapur, Chingleput and North Arcot. But in the four last-mentioned districts, the firka books for several villages have not yet been checked, while in Coimbatore the registers of two villages are said to have been lost, and fresh registers are under preparation. The Collectors report that strict orders have been issued to complete the work without delay. In Madura, the preparation and checking of these registers for over 220 villages have not been completed for fasli 1308, and an almost equal number of villages has yet to be finished for fasli 1309 also. The Collector reports that in spite of the instructions issued last year, no progress was made in posting these records for inam villages, and this was due, as stated in the previous year's report, to the absence of proper accounts for these villages, and also to the inability of the karnams of these villages to prepare the village registers. In Tinnevelly, the checking of the firka books for fasli 1308 in the case of 17 villages

has not been finished in Srívilliputtúr taluk. In South Arcot, firka books for 234 villages have not been prepared and for 587 villages have not been checked. The Collectors concerned have taken steps to complete the work. In the remaining districts also steps have been taken to bring the records up to date. The progress for fasli 1310 has not been great and the statistics for that year have only quite recently become available after the close of the fasli. In Nellore and Coimbatore alone has any considerable progress been made. In Vizagapatam, the posting and checking of these registers are complete in two taluks while no progress was made in the Palkonda taluk. In Gódávari, Anantapur, Chingleput, South Arcot, Madura and Tinnevelly, no progress appears to have been made in the preparation of these registers for this fasli. The following table shows in one view the progress made in the several districts :—

Districts.	Number of villages.	Number of villages for which							
		Village registers remain to be		Firka books remain to be		Village registers are		Firka books are	
		Prepared.	Checked.	Prepared.	Checked.	Prepared.	Checked.	Prepared.	Checked.
		Up to fasli 1309.				For fasli 1310.			
Ganjám	1,478	61	61	81	81	299	208	182	..
Vizagapatam	282	..	..	..	..	155	155	155	155
Gódávari	1,381	17	25	36	37	..	..	..	..
Kistna	1,368	2	2	2	2	362	362	161	157
Kurnool	789	9	9	9	194	248	38	202	30
Bellary	962	5	179	14	311	273	117	..	..
Anantapur	740	13	25	27	103	..	..	..	..
Cuddapah	1,354	39	59	51	54	..	..	..	..
Nellore	931	11	11	11	11	600	556	213	30
Chingleput	1,785	6	27	54	75	..	..	..	..
South Arcot	2,700	16	16	234	587	..	..	..	..
North Arcot	1,668	19	24	24	253	688	617	445	216
Salem	3,050	113	113	163	163	273	253	273	253
Coimbatore	1,509	3	3	3	3	1,130	1,020	540	482
Trichinopoly	730	..	..	..	..	‡ 434	306	‡ 411	202
Tanjore	2,478	58	198	58	198	1,515	834	854	471
Madura	938	* 218 † 226	236 226	234 229	249 229	..	..	..	..
Tinnevelly	1,081	53	53	61	* 44 † 17	..	..	..	..
Nilgiris	48	..	13	13	19	..	..	..	..

* For fasli 1309. † For faslis previous to 1309. ‡ Incomplete.

IV.—SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL DIRECTION.

9. *Geology.*—From about the close of October to December 1900, Dr. Walker, Assistant Superintendent of the Geological Survey, was engaged in surveying the Nowrangapur taluk of the Jeypore estate in the Vizagapatam district. The results are stated in the general report of the Geological Survey of India.

As the result of a preliminary survey of the more important quartz veins of the South and South-East Wynaad, made by Mr. Hayden, it was decided to submit two of the mines that had been opened out during the mining activity of the early eighties to a detailed examination with a view to determining once for all, whether with the improved appliances and perfected processes of modern gold recovery, there might be any chance for profitable gold mining in this district. Dr. Hatch carried out this investigation during the year under review. His conclusion was unfavourable.

10. *Botany.*—Mr. C. A. Barber occupied the post of Government Botanist throughout the year, his head-quarters being at Ootacamund. A report on the work performed by him during the year is appended. In connection with the Botanical Survey of India he visited the Vizagapatam and South Canara districts, and in March he visited Calcutta to discuss questions connected with his work with the Director of Survey. About 1,200 sheets were examined, named and added to the Herbarium. The items of economic work dealt with by the Government Botanist during the year are referred to in part V of this report.

11. The work of collecting specimens of the articles included in the "Programme of collections to be made for the Indian Museum and Imperial Institute" was proceeded with, and specimens of 32 articles were forwarded to the Reporter on Economic Products during the year.

12. *Chemistry.*—The report of Dr. Leather, the Assistant Agricultural Chemist to the Government of India, regarding the work performed by him during the short period he was attached to the College of Agriculture during the year, does not show whether any analytical work was done there.

In connection with the investigation into the causes of the sugarcane disease in Gódávari, the Government Botanist recommended that a series of soil analyses should be made to ascertain whether the soils were wanting in any plant food. The Deputy Director selected 25 samples of such soils, and the detailed results of Dr. Leather's analyses have been published in a bulletin of the department. The general conclusions he arrived at were that many of the soils required manure, both lime and phosphates, besides the ordinary organic manure, and that a good dressing of gypsum would be beneficial to them all, but their chemical composition was not mainly responsible for the outbreak of the disease.

13. *Statistics.*—The subjoined statement shows the statistics furnished to the Government of India and the Imperial officers under the control of that Government:—

Name of report.	To whom sent.
Weekly season report	Government of India (Revenue and Agriculture).
Annual programme of famine-relief works (famine statement C).	
Annual statement of collieries	Government of India (Finance and Commerce).
Half-yearly statement of wages of agricultural labourers, &c.	Do. do.
Annual statement of minerals	Director-General of Statistics.
Forecasts of and the reports on the sowings and outturn of gingelly, cotton, indigo, paddy, sugarcane, castor-seeds and groundnuts.	
Rail-borne Trade and road traffic returns—	
Annual and quarterly	
Agricultural statistics	
Statement of cotton and hemp mills	
Do. of paper and woollen mills	
Statistics of tea, coffee and cinchona cultivation ..	
Fortnightly returns of wholesale and retail prices of certain commodities at selected marts.	

As the agricultural statistics for the year have not yet been compiled, it is not possible to compare the estimates of area framed in the forecasts with the actual areas sown.

14. *Meteorology.*—As in previous years the rainfall registered at the rain-gauge stations was tabulated, and the results published by the Meteorological Reporter to the Government of Madras. The total number of stations in the Presidency is 362 showing an increase of 13 stations during the year. Of the stations no less than 299 were inspected during the year.

15. *Entomology.*—Towards the close of the year an Entomologist was added to the staff of the Imperial Museum, Calcutta, for economic research work with special reference to insects injurious to agriculture, and the Agricultural Department of this Presidency was instructed to communicate direct with him on questions of this nature and to co-operate with him in his investigations.

The Nilgiri Planters' Association having reported that tea and coffee were suffering seriously from black bug and other insect pests, and applied for the assistance of an expert to investigate them, a reference was made to the Entomologist, who remarked that it would be impossible to suggest remedies without local investigation into the life history of the insects and the damage done, and that to this end his special deputation should be applied for. The subject is under the consideration of Government.

The damage done by certain beetles to date palms tapped for toddy having been brought to notice, the beetles were sent by the Separate Revenue Department to the Imperial Entomologist and were identified by him as the well-known Palm Weevil (*Rhynchophorus ferrugineus*), and the Rhinoceros beetle (*Oryctes rhinoceros*), and he suggested certain remedies. These were communicated to the Inspectors of the Salt and Abkári Department for guidance.

V.—SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

16. Proposals regarding the provision to be made in accordance with the desires of the Government of India for carrying on agricultural enquiry and experimental farms were submitted to Government early in 1899, and towards the end of the year under report Government sanctioned the starting of the two experimental farms as a beginning. The other proposals made were ordered to stand over but have been disposed of recently. One of the two farms is to be opened at Bellary and the other at Koilpatti, in the Tinnevelly district. Since the close of the year the land required has been acquired and the opening of these farms is being proceeded with, but the initial stages of organization will require a considerable period. The direct agricultural work of the year therefore was very small, as it has been ever since the Government of India requested that action on the conclusions Government arrived at in 1890 might be held in suspense. The subordinate staff of the department was employed, as it had been in the previous year, and the enquiries regarding the sorghum and sugarcane crops of the Presidency have been completed, and are being prepared for publication. One Inspector was on duty throughout the year in Gódávari in watching the sugarcane crops of the delta, and more especially those planted with Hospet cane. Another was engaged in visiting various cane-growing localities during the first nine months of the year, and later on in making detailed enquiries regarding the cultivation of paddy in several districts. Two were employed at head-quarters during the earlier months partly in connection with relief measures, one was deputed to superintend the fibre experiments alluded to below, and the other was sent out to accompany Mr. Royle on the tour mentioned in paragraph 20 *infra*.

17. *The College Farm and the Botanical Gardens, Saidapet.*—A separate detailed report regarding the working of these has been submitted in the Educational Department by the Principal of the College of Agriculture, under whose control the farm is ; the position occupied by the Agricultural Department in relation thereto being only vaguely described. Dairy-farming is the chief item of agricultural work on the farm, but as yet no properly-equipped dairy has been provided. The rainfall was extremely deficient and even the little rain which fell was untimely and badly distributed, in consequence of which all the crops suffered. Further experiments in the cultivation of imported varieties of groundnut were made from the produce obtained in the previous year, but without much success owing to the unfavourable season, and the damage caused by jackals and crows. The produce has, however, been reserved for distribution by the Agricultural Department.

18. *Groundnuts.*—Further reports on the growth of the four varieties of East African seed obtained, and sold to ryots through the Collectors of the chief groundnut-growing districts during 1899, were received about the close of the year under review. Speaking generally, the produce obtained was heavier, matured about a month earlier, was more easily and cheaply harvested, but was more liable to the depredations of vermin, such as crows, jackals, &c., owing to the pods ripening at a smaller depth in the soil, needed a larger supply of moisture and the nuts were more oily and less fit for eating than the indigenous variety. The season conditions under which the experiments were made were, however, unfavourable. Further enquiries as to the results obtained from resowing the seed have, therefore, been ordered.

19. *Seoni wheat.*—As stated in paragraph 27 of last year's report, a further supply of Seoni seed-wheat was obtained from the Central Provinces, and distributed to the Collectors of the Nilgiris and Madura for experimental cultivation. The crop generally failed on the Nilgiris, owing to the unfavourable season and the ravages of the insects known as *Melonantha vulgaris* and *Cockchafer grubs*. The Collector reported

that these insects were also damaging the native barley, and that they were one of the greatest pests on the hills. The investigation of these pests has been entrusted to the Government Botanist, who states that the enquiry will take a long time to carry out.

One of the experiments conducted by Mr. Burrows at Lovedale was, however, a success; three pounds of seed having yielded 33 pounds of grain and 135 pounds of straw. A fresh supply of seed has been obtained from the Central Provinces and sent to the Nilgiris for further experiments.

The result of the experiment in Madura was also unsatisfactory. The plants throve at the beginning but subsequently perished on account of heavy rain.

20. *Sugarcane.*—As stated in paragraph 29 of the previous year's report, owing to the prevalence of disease among the sugarcane in part of the Gódávari delta, a supply of seed-cane was imported from Hospet and sold to certain ryots. The result was a failure. The Hospet cane became badly diseased, apparently contracting the disease after its introduction, but it was not well dealt with by the ryots who purchased it, and the season was remarkable for the phenomenal lowness of the river and bad water-supply during the planting season. Further enquiries as to the state of the local crops showed that they had suffered even more than in previous years from the disease, and in reference to this report Dr. Bourne urged the importance of ascertaining how the disease spreads, and stated that the result of his observations was to show that the commonest medium of infection was the air. The Government Botanist, however, expressed the opinion that the disease was mainly propagated from generation to generation by the selection of unsound seed-cane. A recommendation has therefore been made to Government that it was advisable that the whole question should be threshed out by a committee of scientific and practical officers, with a view to recommending what action should be taken, but no orders have as yet been passed on this suggestion.

In connection with a suggestion made by the Madras Chamber of Commerce, that the department should import immune varieties of sugarcane from other countries, it was pointed out that in all probability the existing stocks comprised a number of valuable varieties, whilst the Government Botanist urged that the existing information from a chemical point of view regarding the different kinds of cane already grown in this Presidency was inadequate. Arrangements were therefore made for the analysis of the juice of the different kinds of sugarcane grown in this Presidency, and as Dr. Leather, the Agricultural Chemist to the Government of India, was unable to depute an assistant for the work, the services of Mr. Royle, a chemist employed by Messrs. Parry & Co., were obtained for a period of two months. He visited the various cane-producing districts accompanied by an Agricultural Inspector, and analysed 77 different samples of cane. The results obtained establish the fact that some of the sugarcanes grown in this Presidency are very valuable varieties.

21. Besides the work referred to in the last two paragraphs, the Government Botanist carried out an investigation into the damage caused by the tea-eel-worm on the Nilgiris. His detailed report on the subject has since been published as a bulletin of the department. He also devoted some time to the investigation of the damage caused to date palms by the beetles referred to in paragraph 15 *supra*; but owing to other more pressing work, the field study of the pests was not continued long enough for him to make any useful suggestions regarding their treatment.

22. *Sisal hemp.*—In 1898, 3,000 plants of the *Agave Rigida Var Sisalana* were obtained from the Madras Agri-Horticultural Society and distributed to the Collectors of Bellary, Anantapur, Salem, North Arcot, Cuddapah, Nellore, Coimbatore and Madura for experimental cultivation. By 1899, almost all the plants in the four last-mentioned districts had died, but most of those planted elsewhere were reported to be thriving. Further reports show that the plants have failed in Bellary and Anantapur also. Such sporadic efforts not being likely to prove of any particular value, it was decided in October 1900 to carry out departmentally an experiment in the growth of this and similar fibre plants on an adequate scale, in a locality where waste land suitable for the plants is available. Such sites were found near Hindúpur in the Anantapur district, and the experiment is being conducted under the supervision of an Agricultural Inspector deputed to the work. Hitherto the main work has been to collect as large

a stock as possible for planting out and but slow progress was made during the year under report in this respect; though more success has been attained during the current year.

23. *Durian plants.*—Towards the close of the year, 150 Durian plants were distributed by the Madras Agri-Horticultural Society, at the request of the department, to several officers in Vizagapatam, Coimbatore, Madura, Nilgiris, South Malabar and North Malabar for experimental cultivation. The results will be reported in due course.

24. *The Madras Agri-Horticultural Society.*—The income of the society by the sale of plants, seeds and sundries amounted to Rs. 4,938, while the collections by way of subscriptions from members amounted to Rs. 1,975. A grant of Rs. 4,000 was made to the society by Government as usual. The flower-show held on the 24th February 1901 was, on the whole, a success. An index of the society's library is reported to be in course of preparation. This, when complete, will doubtless be of great service to members and others wishing to use the library.

25. *Veterinary Science.*—The questions whether the Bacteriological Survey, for which the veterinary subordinates in this Presidency had been solely retained, should be continued; how the establishment might be otherwise employed; or whether it should be dispensed with, as well as other matters connected with the working of this branch of the department were discussed with the Inspector-General, Civil Veterinary Department, in December 1899, and as the outcome of this discussion, proposals for a reorganisation were made early in 1900, on which the orders of Government were received in October 1900. They have not as yet been given effect to owing to the Superintendent, Civil Veterinary Department, having reported that he is unable to nominate competent trained men to fill the posts newly sanctioned by Government; nor have the Stock Inspectors, whom it was decided to dispense with, been brought under reduction. They have since been employed in collecting such information as the Superintendent may require, whilst the notice of discharge issued to four of them has been held in suspense in deference to his representations. The question whether it is not possible to find competent upper subordinates is still under consideration.

The inoculation of 60 cattle against rinderpest with serum prepared at the Maktesar laboratory was carried out at Atmakúru, Kurnool district, during the year, but otherwise though several outbreaks of this disease were reported from other places and Stock Inspectors were deputed to ascertain whether the extent of the outbreaks and the attitude of the ryots afforded an opportunity for carrying out prophylactic inoculation, it was generally found that the disease was subsiding by the time they arrived, or that the ryots were unwilling to allow their cattle to be inoculated. The Superintendent has, however, been requested to carry out further experiments wherever possible.

The proposals made by the Inspector-General of the Civil Veterinary Department for the establishment of a Veterinary College in this Presidency fell through, as it was considered that the demand for such an institution was not sufficient to justify its establishment, and that the work of teaching in connection therewith would interfere very seriously with the more important duties of the Superintendent in the mofussil.

The establishment of a few veterinary dispensaries at carefully selected centres was sanctioned, but the scheme is held in abeyance pending the selection of properly trained men.

26. *Pony and Mule breeding operations.*—One pony stallion was cast in June 1900 and fourteen remained at work during the year: nine in Coimbatore, four in Salem and one in Madura. One of those in Coimbatore was entrusted to the Pattagar of Palayakottai from June 1900. The average number of coverings per stallion was 32 in Coimbatore, and 21 in Salem, as against 39 and 20 respectively in the previous year. The chief reasons assigned by the Superintendent, Civil Veterinary Department, for the small number of coverings were, that care was taken to allow only mares in good condition and those in season to be covered; bad season; and the prevalence of plague and cholera in parts.

Of the 349 mares covered during the previous year in Coimbatore, 13 mares died and the results in the case of 25 mares were not ascertained; of the remaining

311, 79 foaled, 27 aborted, and 205, or 66 per cent. of the covered mares traced, proved empty. In Salem, out of 98 mares covered, 2 died and the results of 22 were unknown; of the remaining 74, 15 foaled, 1 aborted, and 58 mares, or 78 per cent. of the known results, were empty. The percentage of produce foaled to mares covered was 21·6 in Coimbatore and 15·3 in Salem as against 16·0 and 11·0 in the previous year.

Four donkey stallions continued at work—one at Kollegal, another at Hosúr and a third at Dharmapuri. The fourth was at Krishnagiri till October 1900, and was lent to Mr. Blake, of the Devanhalli mule-breeding farm in Mysore, in November 1900. The total number of coverings effected during the year was only 93 against 116 in the previous year. Of the previous year's coverings, 89 per cent. were unsuccessful.

The results of pony-breeding operations have not so far been satisfactory and the question of continuing them came up for consideration, but in deference to expert opinion it has been resolved to persevere in them under certain revised arrangements, and the scheme for increasing the present staff of salustries, referred to in paragraph 32 of last year's report, has recently been sanctioned by Government.

In Coimbatore, 47 entires were castrated as against 56 in the previous year. In Salem, 127 entires were castrated as against 121 in the previous year.

No pony-shows were held during the year owing to the existence of plague.

27. The Cattle Disease Act (Act II of 1866) was put into force at 20 places during the year in connection with large cattle fairs, at each of which a Stock Inspector was present to assist the Revenue officers in carrying out the provisions of the Act and to treat cases of disease.

In January last, the Superintendent of the Civil Veterinary Department having reported that glanders and farcy prevailed on the transit lines in the Dindigul subdivision of the Madura district, the Glanders and Farcy Act was introduced into that tract and continues in force. Twenty-five affected ponies were destroyed before the close of the year under report. The disease appears to be more widespread than was anticipated.

28. *Statistics.*—The following returns were published in connection with local inquiries under provincial direction:—

(1) Report on the operations of the establishments for stamping weights and measures—submitted to Government, Revenue Department, on 1st July.

(2) Comparative statement of irrigation and rainfall—forwarded to the Chief Engineer for Irrigation, in October.

(3) Statement of quantity and value of crops irrigated under major (productive) works and minor works for which capital and revenue accounts are kept.

(4) Triennial report on the subject of agricultural wages, embodied in the Land Revenue administration report—submitted to Government in March.

(5) Season reports in three sections (rainfall, cultivation and prices of foodgrains and salt)—monthly.

(6) Quarterly and annual reports of cattle mortality.

VI.—AGRICULTURAL EDUCATION.

29. Recommendations submitted to Government in February 1899 on the method by which effect might be given to the principles laid down by the Government of India in 1897 as to the reform in primary education, the improvement of readers, the preparation of text-books, and the training of teachers so as to provide men competent to give instruction in elementary agriculture, remained under the consideration of Government during the year. In February last Sir E. Buck visited the Presidency on behalf of the Government of India and had an interview with the present Director on the subject. He made enquiries as to what had been done in the matter of giving instruction in elementary agriculture, and was informed that the proposals made in 1899 regarding the extension of agricultural education were under the consideration of Government, and that under the Madras Educational Rules, the

" elements of agriculture " formed one of the *optional* subjects in Primary and Lower Secondary schools. He was inclined to think that the subject should be made compulsory. He also suggested that the minors under the Court of Wards might be given some instruction in agriculture, and that something might be done by the Court towards introducing improved methods of agriculture in estates under its management. This suggestion is under the consideration of the Court.

30. *Higher Education.*—The College of Agriculture is administered by the Educational department in consultation with the Director of Agriculture on all matters of importance. The number of students in the college showed a small decrease, the falling off occurring amongst those from outside the Presidency. No changes were made during the year in the college course, but the time which the Agricultural Chemist can now devote to work at the College has been reduced to six weeks. During this period he delivered 24 lectures to class III on soils, feeding-stuffs and milk, in addition to 19 hours' practical work, and 19 lectures to class II on organic chemistry, in addition to $8\frac{1}{2}$ hours' practical work. These extremely short courses which are now alone possible are entirely inadequate, and were the more so, as the Principal who lectures on general chemistry was absent on leave during the whole year.

The usual special course of lectures on Veterinary matters was delivered by the Superintendent, Civil Veterinary Department, between 4th October and 15th November. Twelve lectures and ten practical demonstrations at the Veterinary hospital covering 18 hours were given to class III, besides 11 lectures to the second class. The Superintendent also visited the hospital on 15 other occasions. He reported that the students worked satisfactorily in the practical demonstrations, and showed no reluctance in handling animals, dressing wounds and performing other minor operations. The Veterinary hospital continued to increase in popularity, and the number of cases treated has been steadily rising from 380 in 1895-96 to 804 in 1899-1900 and 856 in 1900-1901.

Owing to the unfavourable character of the season, the opportunities of the students for practical farm work were considerably curtailed, but the whole question of how the course in the college can be improved was under discussion by a committee appointed by the Director of Public Instruction, which has since reported. The results of the examinations held in April last were more satisfactory than in previous years.

VII.—THE PUBLICATION OF AGRICULTURAL INFORMATION.

31. During the year under report the following bulletins were published by the department:—

No. 39. The " Sugarcane in the South Arcot district " by Mr. C. A. Barber, the Government Botanist.

No. 40. The " Seed-drill " and other implements used in connection therewith, being notes and remarks thereon, by Mr. C. Benson, and with an historical note on the Bamboo drill by M.R.Ry. C. K. Subba Rau Avargal, Sub-Assistant Director of Agriculture.

No. 41. The " Ground-nut crop " : A report on certain analyses of the ground-nut by Dr. J. W. Leather, Assistant Agricultural Chemist to the Government of India, and notes on some experiments made thereon by Mr. C. Benson.

No. 42. " Native beliefs regarding the hairmarks on horses and cattle " by Veterinary Lieutenant J. D. E. Holmes, Superintendent, Civil Veterinary Department.

No. 43. " Sugarcane in the Gódávari and Ganjám districts." A collection of papers by Mr. C. A. Barber, Government Botanist, Doctor J. W. Leather, Assistant Agricultural Chemist, and M.R.Ry. C. K. Subba Rau Avargal, Sub-Assistant Director of Agriculture.

No. 44. " Notes on the cattle of the Madras Presidency " by Veterinary Lieutenant D. J. E. Holmes, Superintendent, Civil Veterinary Department.

A Monograph on the " Ivory-carving industry of the Southern India " was prepared by Mr. Thurston, Superintendent, Central Museum, during the year, but was published soon after its close. The Government of India has decided not to call for any industrial monograph during the current year.

32. The number of papers received from, and communicated to other Provincial departments was as follows:—

Subject.	Received.												Sent.			
	Reports.		Books.		Pamphlets.		Journals.		Other papers.		Total.					
	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign	Indian.	Foreign.	Indian.	Foreign.	Reports.	Pamphlets.	Other papers.	Total.
Agriculture	15	8	1	18	26	211	71	83	..	1	113	321	..	6	..	6
Statistics.. Crop ..	..	..	5	..	..	..	..	..	..	..	5	..	..	..	17	17
Statistics.. Trade ..	..	..	..	..	..	..	..	4	..	..	..	4	5	..	..	5
Forest	15	..	2	..	1	..	12	..	..	..	30	..	..	..	..	..
Arts and Industries ..	..	..	..	..	3	..	51	..	..	..	54	..	..	1	..	1
Botany	2	..	..	2	..	..	..	..	..	..	2	2	..	..	..	..
Entomology	..	..	3	2	3	..	..	..	..	..	6	2	..	..	..	..
Geology and minerals .	6	..	2	..	..	..	..	..	..	..	8	..	..	..	..	..
Meteorology	19	..	1	..	10	..	..	..	..	..	30	..	..	..	..	..
Live-stock	37	..	..	..	..	..	..	..	..	..	37	..	..	..	..	..
Veterinary science ..	9	..	..	..	..	..	..	..	..	..	9	..	..	..	..	..
Total ..	103	8	14	22	43	211	134	87	..	1	294	329	5	7	17	29

APPENDIX.

Annual Report of Mr. C. A. BARBER, Government Botanist.

I have the honour to forward the following annual report of the work done by the department. The period included is from 1st April 1900 to 31st March 1901.

2. The following were my movements:—

The first half of April was spent at Head office and devoted to routine clerical work. Several visits were also paid to the Dodabetta Cinchona plantations.

Immediately after the Easter holidays I proceeded to Waltair (which I reached on 22nd April) to collect over the Vizagapatam forests. Under the circumstances detailed in my last report, much as I would have liked it, I was quite unable to attempt the more enticing higher Agency tracts, but, because of the condition of my staff, I had to confine myself to the lower, hot hills of the Golgonda taluk. From the specimens obtained, however, I do not think that these parts have been collected over before.

I visited the following places in the Vizagapatam district:—

Pollavaram on the sea coast (26th to 30th April).
Ragupalem, in the dry scrub forest near the railway (2nd to 10th May).
Karaka, on the fine slopes of Karakakonda (12th to 21st May).
Krishnadevipeta, just within the Agency tracts (22nd May to 2nd June).
Nathavaram (2nd to 12th June).
Krishnapuram, again within the Agency (10th to 18th June).

After this I devoted myself to the study of date-palms and examined them wherever I could on my return eastwards. They were inspected at Lakshmipuram, near Narasapatnam, Makarapalem and around Anakapille and Kondakerla.

I reached Ootacamund on 4th July. During the next three months, with one short interval, I remained at head-quarters. The monsoon was an extremely long continued one and touring on the west coast was not to be thought of. The short visit to Devala, referred to below, was during continuous, heavy rain.

This period at Head office was, however, not so productive of good work as could be wished. My staff was, for the first six weeks, almost continuously absent owing to fever contracted during the Vizagapatam tour, and the writer was practically absent from his duties during the whole of this period. He finally left the office through ill-health and my new clerk did not join until the eve of my departure for South Canara.

Under these circumstances, a good deal of clerical work fell to my lot.

An attempt was, however, made to grapple with the naming of specimens collected on tour, and the general lines of work were for the first time settled with my assistant. The more important work of an economic nature during this period was the examination of specimens of tea-seedlings from Devala which had been attacked by a root eel-worm.

For this purpose also a short visit was paid to the infected estate (30th August to 7th September). A few orchids were collected which were new to the collection, the tea estate was inspected and visits were paid *en route* to the Nadavattam Cinchona plantation and one Nilgiri tea estate.

On 5th October I left Head office for a tour in the South Canara forests. The following places were visited :—

Sullia (25th October to 5th November).

Sampagi, at the foot of the Mercara ghaut (5th to 16th November). During my stay at Sampagi, I preceeded on 11th November up the ghaut to Mercara, and on 12th November I collected specimens for the first 18 miles down towards the Coorg boundary. A number (over 100) of interesting plants were found during this little trip.

Jahlsur (16th to 22nd November).

Beltangadi (24th to 29th November).

I reached Ootacamund on 8th December. The remainder of the month was taken in arranging my collections and working up office arrears.

During the Christmas holidays I had the pleasure to entertain Mr. Willis, the Director of the Ceylon Botanical Department. As his object was the same as my own, the exploration of the South Indian Flora, I accompanied him on a short tour to Pykara to examine the river flora there.

I remained at Head-quaters from 9th December till 26th January.

During this time I was without the help of my assistant, Mr. K. Hanumantha Row, who desired to present himself for the M.A. examination in Botany in Madras. At the end of the month, however, instead of returning to his duties, he sent in his resignation in an entirely unexpected manner, thus placing the department in a very awkward position on the eve of my next long tour.

I prepared in January a long memorandum upon the work of the office, a report on the tea-eel-worm disease at Devala and a shorter one on an infestation of white grub which has been known for many years in the Nilgiris.

I left Ootacamund on 26th January and remained in Madras till February 6th, engaged among other things in examining candidates for the post of assistant.

I then proceeded to the Gódávari district and spent from 7th to 28th February in the examination of the sugarcane fields.

I visited the following places :—

Tapeswaram, Mandapeta, Pasalapudi, Vulapalle, Pandalapaku, Tossipudi, Komaripalem, Koppavaram and Biccavol in the Rámachandrapuram taluk; Mondepulanka, Nagadulanka, Tatipaka, Razole and Sivakodu in the Narasapur taluk ; Peddabrahmadeva, Medapadu and Bhimavaram in the Cocanada taluk; and Ragampeta, Vadlamuru, Pulimeru and Gudiváda in the Peddapuram taluk.

On 28th February I proceeded to Calcutta by train and remained there until 18th March In Calcutta I spent most of my time with the Director of the Survey at the Royal Botanic Gardens, Sibpur. I also spent several days with the Reporter on Economic Products and called upon the Entomologist to the Government of India.

I reached Ootacamund on 27th March, and then had the pleasure of receiving visits from Dr. Stuhlman, the Director of Agriculture in German East Africa, and Mr. Augustine Henry, the pioneer botanical explorer in Central China.

3. The collections made during the past year were again large. Part of them were noticed in my last year's report. The districts may be divided up as follows :—

(*a*) Evergreen forests, South Canara, Mercara, Wynaad.
(*b*) Mixed forests, Vizagapatam district.
(*c*) Sea-side flora, Pollavaram (Vizagapatam).
(*d*) River flora of Podostemonaceæ, Beltangadi, Sullia, Sampagi in South Canara, and Pykara on the Nilgiris.

It is difficult to speak of the character of the collections because they are far from being thoroughly studied yet.

The West Coast was visited for the first time, and it is quite evident, from the collections made, that a series of visits down the entire length of the western ghauts will be of advantage. The portion examined during the South Canara tour was the Mangalore-Mercara road, and in this district further visits should be paid to the portions north and south of this tract where the flora evidently differs a good deal. Both the north and the south portions of South Canara near the hills seem to be little known and have certainly not been visited by botanists frequently, if at all.

During the South Canara tour a good deal of attention was devoted to the curious little river group of Podosotemonaceæ. These plants, like mosses and lichens in appearance, are in reality degraded forms of higher plants, the body of the plant simulating the lowest forms in the vegetable kingdom, but minute flowers, consisting of one stamen and one ovary each, indicating their true taxonomic position. The relationship of the Order among the higher plants has not been determined, and the collections from South Indian rivers, one of their principal habitats, are extremely meagre.

My attention was specially drawn to the group by Mr. Willis, who has just concluded a tour down the Western ghauts in search of material for a monograph which he is preparing. I found the river at Sullia full of three species, and again at Beltangadi there was such a mass of interesting specimens that I devoted myself to the river-bed during the whole of my stay there. The result has exceeded expectations, and a very interesting series of specimens has been handed over to Mr. Willis for determination. Curious transitional forms were found, which will necessitate an alteration of the classification, and some of the species are new to science.

During the Christmas holidays the short tour to Pykara in Mr. Willis's company was devoted to the same group.

The tour in Vizagapatam was also interesting in its way, although the time of year, May to June, was hardly the most desirable to explore this hot region. From the plants collected it is at once evident that the parts nearer the hills had not been previously visited. Some of the species described as extremely rare in Hooker's Flora, and not represented in the later collections of the Madras and Calcutta herbaria, were found in great abundance.

During the short tour in the Wynaad in September, while examining the tea-eel-worm disease, a few road-side orchids were collected. Several of these appear to be new to South India and one at least is a new species.

These facts will sufficiently show that there is plenty of work to be done in various parts of the Peninsula. To leave the more distant places out of consideration, the results from the neighbourhood of Devala, not more than 40 miles from Ootacamund, indicate that this tract is by no means worked out, and during the year a new species of orchid has been found abundantly in the neighbourhood of Ootacamund itself.

4. In my last report the accumulation of arrears in naming the plants collected was adverted to. Since that time a change has been made in the distribution of the Government Botanist's time in the field and at head-quarters. Instead of four months at Ootacamund a stay of six months has been sanctioned. One tour in each year will presumably be devoted to economic work and there will thus be a smaller accumulation of plants to be looked through, in that fewer plants will be collected during the year.

It will be evident that during the past year there were unusual difficulties caused by the sickness and absence of the clerk and more especially by the unexpected resignation of the assistant. But a serious effort was made in August and September to put the past collections in order. About 1,200 sheets were examined, named and added to the Herbarium.

It has not however been possible to devote more time than this to the purely systematic work while at head-quarters.

In spite of the Government Order sanctioning the longer stay at Ootacamund, considerably the greater portion of the working year was spent in the field. An attempt will be made in the current year to remedy this state of affairs, but it will not be easy. So much time is taken up in getting to and returning from the centres of collection, especially on the west coast, that the two months provided for each tour are hardly sufficient, and this is especially felt when, as is frequently the case, matters of routine or questions of economic interest have also to be attended to.

It thus remains to be determined whether three principal tours will be possible each year, unless one of these is carried out, in part at least, by an assistant. At present, however, the assistants are hardly fit to be entrusted with such work.

5. The strength of the staff remained the same as last year, but, as already explained, the department was frequently short-handed when the Government Botanist was at head-quarters.

In February 1901, Mr. Venkata Krishnama Nayudu, M.A., of the Madras University, joined as Assistant in place of Mr. K. Hanumantha Row, B.A., resigned.

The new year will open with two assistants at Head office instead of one, and a considerable increase in the usefulness of the department may be confidently expected. It must be borne in mind, however, that these will have to be trained, and that a couple of years must elapse before they will be of much service in the more responsible work of naming plants. After two years of training the late assistant was entrusted with certain portions of the work, such as making a preliminary study of the field collections and naming the orchids and grasses. It will require a proportional period of time before the new assistants can be entrusted with this work, and, for the present, with the necessary training that they will require, the Government Botanist's hands will be rather fuller than before.

6. As reported last year a request was forwarded from the Government Botanist that he might be allowed, like the Government Botanist of the North-Western Provinces, to pay a visit to Calcutta for consultation with the Director of the Survey of India. This was granted by Government and the visit took place during March 1901.

One hundred and seventy specimens were taken to be named. These did not include all the plants about which doubt was felt or which local material was insufficient to determine, but were those set apart during the earlier tours alone. Of them 101 were worked through and the rest brought back to Ootacamund. About four new species were noted and the Grewias, so abundant a feature of our mixed forests, were subjected to a careful analysis.

A great deal of useful information was gathered in conversation with the Director, whose advice was sought on many matters which had arisen since the Government Botanist had taken over Mr. Lawson's duties.

A careful study of the mode of working and the requirements of the Reporter on Economic Products was made, as far as they referred to economic botany, and every facility was placed in the way of the Government Botanist to make use of the files and specimens collected in the Calcutta office and museum. In questions of difficulty it has been arranged that the files on particular subjects may be sent down to the office of the Government Botanist, and thus the stores of information accumulated in the office of the Reporter on Economic Products will be available for this Presidency, without the necessity of sending a series of enquiries to be dealt with at a distance and without full knowledge of local conditions. In return the Government Botanist has agreed to assist in the collection of specimens and photographs of the more important trees which have their habitat in this Presidency.

Altogether the amount of assistance obtained during the short visit to Calcutta was so great that an early opportunity will be sought to repeat the visit and deal with another batch of doubtful and interesting plants, and also, if time permit, to work up any of the pests among South Indian plants concerning which there is insufficient information in the Presidency. The cold-weather tour will frequently be in the northern part of the Peninsula, and since the Government Botanist is then nearer to Calcutta than to Madras there would appear to be less difficulty in his making the visit at that time of year.

7. A good deal of attention has been given during the past year to grasses. A collection has been forwarded to the United States Government Agrostologist in exchange for those received from him last year.

As the result of correspondence with the Government Botanist of New South Wales a set of grasses is expected from him, and a series of exchanges will be entered into.

The attention of the Government Botanist has been directed to the question of grasses and fodder plants in the Madras Presidency, and a list has been commenced at the instance of the Forest Department. This work has been definitely postponed for the present by the change of assistants, since the naming of grasses was part of Mr. Hanumantha Row's special work. It will however be taken up again as soon as the new second assistant is able to devote himself to it.

The invitation of the Government Botanist to Forest-officers to send up special collections of interesting forest plants has met with some recognition during the year.

Three sets of grasses were sent by the District Forest-officer of Coimbatore and the names forwarded to him.

Two parcels were received from the Conservator of Forests, Northern Circle, and one from the District Forest-officer, Vizagapatam. These have not yet been attended to but will occupy the second assistant's attention immediately.

8. Various requests for specimens have been received from scientific men in other parts of the world.

Enquiries have been received by specialists in Germany for South Indian Myrsineae and Cariceae.

Podostemonaceae are being collected for special monographic purposes.

Requests have been received for South Indian Hepaticae, Ebenaceae and parasitic plants.

The Reporter on Economic Products requires specimens of timbers of foliage and photographs for his museum in Calcutta, and various other enquiries have been received.

It will be obvious that, for the department to be useful in the true sense of the word, it is advisable to endeavour, as far as possible, to meet with these requests, and an attempt will be made to do so. On the other hand, it will be equally obvious that no special expeditions can be undertaken excepting for Government work, and the particular specimens referred to can only be collected during the ordinary tours. The Government Botanist is however still practically single-handed and work of this nature will be slow.

9. I now turn to the economic work accomplished during the year. Among the most important enquiries are the following :—

Sugarcane disease.—With the exception of an examination of canes sent from Chendragiri the attention of the Government Botanist has been entirely directed to the Gódávari fields. A tour was arranged in February for the purpose of a thorough investigation, and the result will be submitted in a separate report.

The industry is reported to be in a deplorable condition and the time has arrived for definite Government action to be taken. During the year some canes imported from the Hospet district have been grown by the ryots, but the results have not been satisfactory. The only direction in which Government can usefully intervene is in the establishment of a small experiment station, whose primary object is the introduction of healthy plant cane, but where it will be well for sundry trials to be made with the view of improving the agriculture of the district. The practice of the ryot is not suited in all cases to a better class cane and there are a number of points in

which he can be advised. The main reason for the present outbreak is thought to be the water-logged condition of his fields, and an attempt should be made to improve the drainage and working up of the soil.

The main disease is caused by Colletotrichum falcatum. During the recent tour a number of small shot-borer beetles have been met with in different fields. These have been reported from different parts of India and are probably Dinoderus minutus Fabr. The Government Botanist regards them as one of the sequelae of the fungus disease, but this view is not universally held and the matter calls for further study. There is some probability of the spread of this infestation during the coming year.

An interesting parasite of the moth-borer has been discovered, and a number of observations have been recorded regarding the mode of life of the fungus.

A careful study has been made of the varieties of a cane which at different times have found favour with the ryots, and it is evident that, in the past, there has been a regular succession of kinds, each in turn put on one side because of disease or to make way for a kind superior from the jaggery point of view. The mind of the ryot is thus accustomed to change and it will not be difficult to persuade him to take up the cultivation of a new kind if the Department of Agriculture has one to offer him.

10. *An infestation of eel-worms.*—Heterodera radicicola Muezl., in a tea plantation in the Wynaad has received very careful attention during the year. The estate was visited and a report was prepared by the Government Botanist, which is being printed as a Bulletin of the Agricultural Department. The eel-worms are widely scattered over the Nilgiris, chiefly in garden cultivations. In the particular case under consideration the whole of the tea nurseries were swept away. It was found on examination that the adult plants were in no cases touched, but that a number of common weeds were attacked, and undoubtedly acted as foster parents and carriers of the disease. The eel-worms were also observed in Cinchona plants but do not seem to be doing much damage there.

One of the most interesting observations in connection with this subject was that several of the Leguminous weeds were found to be infected. These plants have had a good deal of attention devoted to them in late years, and various attempts have been made to encourage their growth on tea and coffee estates because of their nitrifying nodules. The galls formed by the eel-worms are sometimes very like the nodules referred to and thus it becomes advisable to definitely determine, in each case, the nature of these excrescences before encouraging their growth as a green-dressing.

11. A certain amount of time was devoted to the study of date palms, but the area over which the plantations are distributed is so wide that they could only be examined in one locality.

It is supposed that more date trees are dying now than formerly, and it has not been determined whether this is due to the new method of taxation and the greater exhaustion of the trees or the destructive attacks of certain beetles. From observations made on the latter it was found that many trees are undoubtedly destroyed by two forms of boring beetles, Rhynchophorus ferrugineus and Orycteres Rhinoceros (I am indebted to the Director of the Calcutta Museum for naming these for me).

These are well-known enemies of the date tree and have probably been in existence for a long time.

The question whether the date palms are really dying in larger numbers than in former years does not appear to the Government Botanist to be settled, and it seems that this should be the first point decided. This cannot however be done by a mere inspection of the trees. It is a matter of statistics, and a careful examination of the records of the Revenue Department is required. It will then be found whether the new system of taxation introduced into certain districts is inimical to the life of the groves.

The habits of the beetles are fairly well known by the ryots, and in their daily inspection of the trees for tapping purposes they can usually easily tell if the wound has been made the point of entry of the beetle. If this is the case they at once probe the channel with a needle-like leaflet of the tree and generally succeed in dragging out the young grub.

The field study of the pests was not long-continued enough for the Government Botanist to be able to make useful suggestions as regards treatment. Obviously any attempt at painting the wounds over is out of the question, unless the tax is remitted on such trees. There seems on the other hand a good deal of doubt as to the natural reproduction of the date palm, and if time is afforded for this study the department might usefully intervene. It is however a very large question owing to the scattered nature of the plantations and the various conditions under which they are grown and rented.

12. The failure of some experiments on Seoni wheat in the Nilgiris gave the opportunity to the Government Botanist to take up the difficult study of the various cock-chafer grubs which infest the grass and garden lands of the district. But little is known of the species which are to be found, and the next flights, which will occur in the May rains, will be investigated. The beetles can only be determined when in their mature condition and as they appear to emerge from the ground for purposes of reproduction in the spring of each year, this is the time to study them.

In Europe a destructive fungus is sown among the white grubs, and is an article for sale. The grubs on the Nilgiris will be observed during the year and experiments made as to the presence or otherwise of such a disease among them. If it be found to occur and the laboratory is in a position to undertake the work, an attempt will be made to spread the disease. Such a disease has been met with in Ceylon and there seems no reason why it should not occur in the Nilgiris too. The subject is however one of extreme difficulty, especially as there appear a great number of different varieties of cock-chafer on the hills, and it is not improbable that a fungus which will attack one of them may not affect another.

Besides this, the introduction of disease into plant and animal pests is not yet properly worked out and the few successes thus far met with are out of all proportion small in comparison with the failures.

A few isolated observations have been made upon the tea and coffee pests of the Nilgiris, but no time has been devoted to the subject at present.

13. A fairly large collection of diseases of plants has now been got together. The bulk of these are naturally in the sugarcane, and there is great deal to be done in their further examination. Little has been attempted during the past year in this direction, but one observation made upon Chendragiri canes in the laboratory is of some importance. Upon cutting these canes open it was found that the internal cavity was lined with masses of conidia of Colletotrichum falcatum. This is a new observation and shows pretty plainly the way in which the disease is principally spread. The numbers of spores in these internal cavities is so enormous that the disintegration of the plant is evidently awaited by the fungus for its dispersal. This point has since been studied in the field, where it became easy to find these conidia, after a little practice, in the canes lying in the water channels.

But work of this kind although very instructive has been barely possible during the year The disease specimens are now being arranged and the whole series of over 200 numbers placed in order. They are permanently preserved in various manners best suited to them. There are thus herbarium specimens on paper, others dry and poisoned in bottles, some in insect-collecting boxes, but the bulk are preserved in spirit.

14. As will be evident from the preceding paragraphs, a considerable change has taken place in the scope of the Government Botanist's work. Instead of the economic work of the department being made subsidiary to that of the survey, the study of economic questions is recognised as being an integral part of the Government Botanist's duties, and it is probable that at least one tour each year will be devoted to the study of some form of cultivation, if such study is found to be desirable.

From the arrangements made with the Reporter on Economic Products to the Government of India, the Government Botanist will work hand-in-hand with the department of the latter in questions dealing with plant diseases. This is the more desirable as there is to all appearance plenty of room for the work of all the students of plant life that are likely to be available in India for many years to come.

Vigorous attempts have been made during the year to obtain the sanction for the appointment of a second assistant so that both branches of study, systematic and economic botany, may be proceeded with without clashing, and the second assistant has been already selected and will commence his duties at the beginning of the new year, April 1.

15. The library has had few additions made to it during the year and such as have been made will be noted in a subsequent report. It is obvious that, unless this matter of library be attended to, there will be greater difficulty in answering the various questions which arise.

Advantage was taken of the visit to Calcutta to consult the Director of the Botanical Survey as to the most urgently needed of the purely systematic works, and when the time comes to frame the budget estimates for 1902–1903 these books will be dealt with.

At present no periodicals excepting the Archief voor de Java Suikerindustrie are received by the department by purchase. The lists of those received for perusal from the Board's library and in the Government Botanist's private library are practically the same. But it is necessary for a certain number of periodicals to be retained on the library shelves for reference, and this matter will receive attention as soon as the Government Botanist can devote himself to it.

It is obvious that the department will, in the meantime, be starved in this respect, but there is no way of avoiding it. There is little time, when constantly touring about, to consider these questions, and they will perforce be left until the monsoon recess.

16. Two bulletins have been issued during the year by the Agricultural Department, that have been written by the Government Botanist :—

No. 39. Sugar-cane in the South Arcot district (containing an illustrated account of an outbreak of loose smut in the canes there).

No. 43. Sugar-cane in the Gódávari and Ganjám districts. (This contains an illustrated description of the Gódávari cane disease caused by Colletotrichum falcatum Went. It was written in January 1900 and published in March 1901.)

The report on eel-worms from the Wynaad will also be shortly published in illustrated form.

Resolution—Mis. No. 4778, dated 12th September 1901.

The Board begs to submit herewith its report on the operations of the Department of Land Records and Agriculture for the official year ending 31st March 1901. The arrangement of the report is in accordance with precedent, but the matter contained in paragraphs 5, 6 and 8 is more pertinent to the Land Revenue or Revenue Settlement Departments than that of Land Records.

(True Extract.)

(Signed) R. V. SRINIVASIAR,
Secretary.

To the Secretary to Government, Revenue Department, with report.

Order—No. 1103, Revenue, dated 26th November 1901.

Miscellaneous.

With its Proceedings read above the Board of Revenue submits its report on the operations of the Department of Land Records and Agriculture during 1900–1901.

2. *Land Records Establishments.*—The Board's scheme for the creation of a special land records staff for supervising the maintenance of survey and other land records is still under the consideration of Government. Orders have been separately passed on the connected question of the reorganisation of the Survey Department.

The training of karnams and Revenue Inspectors in survey work received attention during the year. Progress has also been made in the revision of village establishments in Kistna and Ganjám; and in the extension of Madras Act II of 1894 to the larger inam villages in the several districts of the Presidency.

3. *The utilization of land records.*—The preparation and checking of village registers and *firka* books still continue to be unsatisfactory, especially in the Madura and Tinnevelly districts. Every effort should be made to write up these records completely and to bring them up to date.

4. *Scientific and natural enquiry under Imperial direction.*—The Government Botanist continued the botanical survey of the Presidency: about 1,200 sheets were examined, named and added to the herbarium. Several problems in economic botany were also investigated during the year and are described in the appendix to the present report. With reference to paragraph 8 of the Botanist's report he will be reminded that the term of his employment on botanical work in this Presidency is limited, and that in attending to the scientific inquiries of specialists in other parts of the world he should be careful to see that such demands upon his time do not encroach upon his more particular duties.

The addition of an entomologist to the staff of the Imperial Museum during the year under review will, the Government hopes, prove useful to the Agricultural department.

5. *Scientific and local enquiry under Provincial direction.*—Arrangements are being made for opening two experimental farms—one at Bellary and the other at Koilpatti, in the Tinnevelly district. The development of these farms will be awaited before other farms are started and before the agricultural department is further strengthened. The Government of India has, however, been addressed on the subject of the appointment of a second European expert to the department with a view of his receiving the training and acquiring the experience necessary to qualify him eventually for the post of Deputy Director.

6. The work of the Civil Veterinary department has been separately reviewed in G.O., No. 600, dated 13th July 1901.

7. The experiments with imported ground-nut seed do not appear to be very encouraging. The results of the re-sowing of the seed will be awaited. The experiments with "seoni" wheat were also generally unsatisfactory, the season being unfavourable.

The analyses of sugar-cane juice conducted during the year by Mr. Royle appear to establish the fact that some of the canes grown in this Presidency are valuable varieties and that there is no reason for considering at present the question of the importation of foreign canes. The importation of the seed-cane from Hospet into the Gódávari delta did not meet with the success which was expected. The Hospet-cane became badly diseased, apparently contracting the disease after its introduction. Scientific opinion differs as to how the disease spreads. On the one hand it is suspected that the infection is commonly through the air. On the other hand it is maintained that the disease is communicated from generation to generation by the selection of unsound seed-cane. The question of how this problem may be best investigated is under the consideration of Government.

8. Experiments with *sisal hemp* begun in 1898 proved a failure. The results of the departmental cultivation, which is now being carried on, of the plant will be awaited.

9. *Agricultural Education.*—The recommendations of the Board in the matter of agricultural education will be taken into consideration as soon as the conclusions of the recent Educational conference at Simla have been communicated to the Government.

10. *Publication of Agricultural information.*—The more important investigations of the year were duly published in bulletin form. No information is, however, given in the report, as to what steps were taken to place the information acquired within easier reach of the ryots. Nor is it stated how far the suggestion of the Government made in the review of the preceding year's report was carried into effect, that such information might with advantage be published in the village sheets of the District Gazettes, and copies distributed by the karnams to the leading ryots.

(True Extract.)

(Signed) G. S. FORBES,
Secretary to Government.

To the Board of Revenue (Revenue Settlement, Land Records and Agriculture).
„ the Educational Department.

Endorsement No. 1103A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) E. S. LLOYD,
Under Secy. to Government.

Exd. Shaik Karim.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE,

MADRAS PRESIDENCY.

FOR THE OFFICIAL YEAR

1901-1902.

LIBRARY OF THE BOMBAY BRANCH OF THE ROYAL ASIATIC SOCIETY.

MADRAS:
PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS.

1902.

REPORT

ON THE

OPERATIONS OF THE DEPARTMENT OF LAND RECORDS AND AGRICULTURE

FOR

1901-1902.

I.—PREFATORY.

The post of Director of the Department was filled by the Hon'ble Mr. H. Bradley from 1st April 1901 till the first week of May, after which date the Hon'ble Mr. J. N. Atkinson took over charge. Mr. C. Benson, M.R.A.C., the Deputy Director, was on duty from 3rd April till the end of the year. The office of the Superintendent, Civil Veterinary Department, was held by Veterinary-Lieutenant J. D. E. Holmes, M.A., A.V.D., till the 14th September 1901, when he was transferred to the Bacteriological Laboratory at Muktesar. His successor, Veterinary-Major W. D. Gunn, did not join till the 12th March 1902, and in the interval the Deputy Director was in charge of the office of the Superintendent. The Government Botanist, Mr. C. A. Barber, was on duty throughout the year.

2. The state of the season during July, August and September 1901, and again in February 1902, took the Director on tour into the Anantapur, Bellary, Cuddapah, North Arcot and Chingleput districts. In the latter part of December, he inspected the experimental farm in Tinnevelly and made enquiries regarding the Periyár irrigation in Madura. From the 14th January to 9th February he was on tour with the Irrigation Commission, whilst the Deputy Director also accompanied that body throughout their tour in this Presidency, except to Ootacamund. The work of the Deputy Director was almost entirely agricultural and that officer during the year paid frequent visits to the Bellary and Koilpatti farms and on three occasions visited the experimental agave plantation at Hindupur. In August, at the request of the Court of Wards, he inspected the home-farm of the Sivagiri estate in Tinnevelly and reported on its management. Towards the close of November, he proceeded to Bezwada and Nellore to meet Mr. Fuller, Secretary to the Government of India, Revenue and Agricultural Department, in connection with questions relating to the maintenance of land records and survey marks. He visited Gódávari in December for inspection of sugarcane crops and again in February to arrange with the Government Botanist for starting the experimental sugar-station at Samalkót. During March he accompanied the newly-appointed Inspector-General of Agriculture when he toured in this Presidency, visiting the Kurnool, Bellary, Cuddapah, Coimbatore and Gódávari districts.

II.—LAND RECORDS ESTABLISHMENT.

3. No regular survey schools were held during the year. The question of how the training of karnams in surveying should in future be provided for is under discussion. No district surveyors were employed during the year in the three districts where the Survey Department was working nor in the Madras district. In Malabar, a district surveyor was appointed in November, as by that time the survey work in the district had been almost completed and the survey establishments disbanded. He completed the training in survey of the Menons of all the taluks of Malabar excepting Kurumbranád and Chirakkal. In the other districts, the district surveyors were chiefly engaged in training karnams and candidates for the post of Revenue Inspectors in survey; in examining the karnams' field-measurement books and inspecting their work in connection with the measurement of subdivisions and examination of boundary marks; and in attending to the work of demarcation and subdivision connected with intricate boundary disputes and other cases specially referred to them by Collectors, such as could not be attended to by the Revenue Inspectors. The following abstract shows details of the work done in such districts for which information is available:—

District.	Number of karnams whose work was inspected.	Number of villages inspected.	Number of fields, the plotting of which was tested.	Number of sub-divisions tested in field and plotting.	Number of missing stones inspected.
1	2	3	4	5	6
Vizagapatam	129	195	2,378	416	6,617
Gódávari	..	..	..	..	1,125
Kistna	59	93	346	3	4,320
Bellary	50	31	2,499	370	1,782
Anantapur	..	..	9,837	..	..
Cuddapah	..	..	6,054	281	30
Chingleput	191	265	4,161	292	11,509
South Arcot	8	10	1,176	48	461
Tanjore	94	96	832	3,005	264
Trichinopoly	78	78	1,524	773	7,770
Salem	53	57	460	165	398
Coimbatore	..	..	40,279	1,216	23
Madura	..	..	1,290	..	332

4. The results of the periodical inspections of village and taluk accounts by District officers have been reported in the Annual Jamabandi report.

5. *The use made of the Land Records staff in connection with Famine Relief.*—A test work opened in Cuddapah during the latter half of the previous year was carried on till the end of June 1901, when it was closed, as the number of coolies attending did not justify its further continuance. Portions of North Arcot district having been affected by the failure of the north-east monsoon of 1900, a test-work was opened there early in April, but it attracted very few labourers and was closed in June. The south-west monsoon of 1901 was late or deficient in the Anantapur, Cuddapah, North Arcot and Chingleput districts and the opening of test works in Cuddapah and North Arcot districts was found necessary, whilst kitchens for feeding destitute children and old and infirm persons were also opened in all the four districts. The advent of the north-east monsoon put an end, however, to all fear of distress. The usual duty of the Land Records staff in collecting information and reporting on the state of the season was systematically carried on, whilst the inspection of the tracts affected received closer attention than usual, with a view to questions of the remission or postponement of land revenue being properly considered. The necessary enquiries into applications for the grant of State loans both for land improvements and for purchase of fodder also fell as usual on this establishment.

III.—UTILIZATION OF LAND RECORDS.

6. The manner in which these have been maintained has already been reported in the Annual Jamabandi report of the Board of Revenue.

IV.—SCIENTIFIC AND NATIONAL ENQUIRY UNDER IMPERIAL DIRECTION.

7. *Geology.*—The survey of Vizagapatam referred to in the previous year's report was continued from December 1901 by the Geological Survey.

8. *Chemistry.*—The report of Dr. Leather, Agricultural Chemist to the Government of India, regarding the work done by him during the short period of his stay at Saidapet shows that he did not perform any analytical work there.

9. *Entomology.*—Specimens of locusts, which passed through Gódávari and Kistna in June 1901, were forwarded to the Imperial Entomologist, who found that those from the Gódávari district belonged to two species: *Acridium peregrinum, Oliv* and *Oedalus Senegaleusis, Kranss, Family Acrididæ*, while those from the Kistna district were the ordinary migratory locust, *Acridium peregrinum.*

V.—SCIENTIFIC AND LOCAL ENQUIRY UNDER PROVINCIAL DIRECTION.

10. As stated in the previous year's report, the starting of two experimental farms was sanctioned about the end of that year, one at Bellary and the other at Koilpatti in the Tinnevelly district. The sites were selected and the land required was acquired during the early months of the year, that at Bellary being obtained first. Work began there in June 1901, and fair progress was made, during the year now under report, towards the completion of the necessary buildings and in other matters connected with the laying out of the farm. Trial crops were grown on the experimental plots, but their outturn showed such considerable variations that it is considered advisable to await another year's results before attempting comparative experiments. Meanwhile from the crops grown, specimens of definite varieties of sorghum and cotton have been obtained. At Koilpatti, the land was not obtained till a little later and the progress made was slower, but so far as field work was concerned, has equally advanced. The main plots for future experimental work were laid out and were all sown with cumbu (*Pennisetum typhoideum*). The results were even more irregular than at Bellary. This farm consists of two blocks, one of red soil, in which there are several wells, and the other of black soil; a good deal of the latter was in foul condition when taken over, and is in process of cleaning. On some of this black soil, besides the cumbu mentioned above, cotton was sown, from which seed of recognisable varieties was selected. Another portion was sown with white cholam from Bellary, but the crop failed. On the red soil block, a considerable portion was sown with horsegram and the rest with a variety of crops. The most interesting results were obtained with the peculiar "Irungu" cholam of the south, of which a number of varieties have been separated for future investigation and with groundnuts—a new crop in the locality.

11. *Groundnuts.*—Complete reports on the further experiments with certain varieties of the East African, the seed of which was obtained in 1899, alluded to at paragraph 18 of the last year's report were not received till after the close of the year and will be dealt with separately.

12. *Aloe plantation.*—With a view to obtain some definite information as to the rate and cost of production of the various agaves, the value of which as fibre plants has recently come strongly to public notice, a small area of land was taken up near Hindupur in the Anantapur district and 27,000 plants put out in various methods there. The Agave Sisalana plants were obtained partly from the Madras and Bangalore gardens and partly from Poona: the Agave Vivipara from Dharwar. Of the plants set out, about 4,800 have died, and the remainder were doing fairly at the end of the year. The only expense at present incurred is for a watchman, but it is desirable that the area should be considerably increased if plants can be obtained.

Agave Sisalana	6,225
„ Americana	6,325
„ Vivipara	13,920
Fourcroya Gigantea	540

13. *Sugar-cane.*—The recommendation made to Government to appoint a committee of experts to investigate the sugar-cane disease prevailing in the Gódávari district as to the cause and method of propagation of which there were differences of opinion, was disposed of by Government towards the end of the year by ordering a further scientific investigation of the precise nature and mode of propagation of the disease by the Government Botanist, and to enable him to carry on the investigation, the starting of an experimental station was sanctioned and towards the end of the year, the lease of a block of land was obtained for the purpose at Samalkot, which was planted up under the personal supervision of that officer, a plan of action having been settled by him in communication with the Deputy Director.

14. *Botany.*—The Government Botanist was engaged primarily to carry on the systematic Botanical survey of the Presidency as part of such survey of the whole of India. Experience has, however, demonstrated that the work of economic research is much more important and urgent and will afford constant occupation to a special officer. It has therefore been decided to make the appointment, originally sanctioned as a temporary one for five years, permanent. The Government Botanist will now become one of the staff of the Agricultural Department as expert adviser in Economic Botany.

A report on the work done by Mr. Barber in the year is appended. In connection with the Botanical survey of India, he visited a portion of the hill tracts of the Tinnevelly district in May to July 1901, and at the request of the Forest department he visited the Anamalai hills in October–November. Collections of grasses were made at different parts and special attention was devoted to forest trees. The total number of plants collected in the year was larger than in any previous year. Over 4,000 sheets of specimens were poisoned and mounted. Under Economic botany, besides the work done in respect of sugarcane, the Government Botanist continued his investigation of the damage caused to the date palm by beetles and also devoted attention to the mode of tapping and general life of the palms in the Gódávari district on which an interesting report was submitted after the close of the year. He also paid some attention to a pepper-vine disease in the Wynaad, to the investigation of which the planters have desired the deputation of an expert.

15. The work of collecting specimens of articles for the Imperial Institute was proceeded with. Revised lists of products previously indented for and not supplied and of new products, was received from the Reporter on Economic Products during the year and the necessary instructions were issued to the Collectors and other officers for the collection of the articles required. Specimens of twelve articles were forwarded during the year.

16. A separate detailed report regarding the working of the Agricultural College Farm and Botanical Gardens, Saidapet, has been submitted in the Educational department by the Principal of the College of Agriculture, under whose control the farm is. The farm was conducted purely for educational purposes, and with its working, the Agricultural Department has no connection.

17. *Meteorology.*—As usual the rainfall registered at the rain gauge stations was tabulated and the results published by the Meteorological Reporter to the Government of Madras. The total number of stations in the Presidency at the end of the year was 427 (inclusive of 61 in the Native States) or 4 more than at the end of the previous year; of these 329 stations were inspected during the year.

18. *Veterinary Science.*—The report of the Superintendent has been separately published. Owing to the fact that no Superintendent was on duty for about six months, very little progress was made during the year, but the Upper Subordinate staff was reorganised, and the remaining Stock Inspectors who were not considered fit for the post of Veterinary Assistants were pensioned. At the instance of the Government of India, in order to provide a staff of Lower Veterinary subordinates, the Government decided that arrangements should be made for providing Veterinary instruction in the vernaculars at the College of Agriculture, Saidapet, and when the new Superintendent joined in March, he was called upon to prepare a scheme, in communication with the Principal of that College.

Two pony stallions were destroyed during the year, leaving twelve at work—eight in Coimbatore and four in Salem. The average number of coverings per pony was 35·4 against 29 in the previous year. Of the 407 mares covered in the previous year, 221 were found to be empty and the results in 83 cases were not ascertained. The remaining 103 includes mares which aborted.

There were four donkey stallions at work—one at Kollegal and two in Salem, while the fourth was lent to the Devanhalli Mule-breeding Farm in Mysore. The last has since been returned by it. The average number of mares covered was 24 against 23 in the previous year.

Fifty-six entire ponies were castrated in Coimbatore and 78 in Salem against 47 and 127 in the previous year.

The revised arrangements for pony-breeding operations referred to in the previous year's report were not introduced in the year under review as the new Superintendent did not join till towards the close of the year.

No pony shows were held during the year.

19. The Cattle Diseases Act (Act II of 1866) was put in force in 21 places, all in the Tinnevelly district in connection with large cattle fairs: and wherever required, a Stock Inspector or a Senior Veterinary Assistant was deputed to assist the local authorities in carrying out the provisions of the Act. The Glanders and Farcy Act, which was introduced into the Madura district in the previous year, continued in force up to November, when it was withdrawn, owing to absence of a professional Superintendent. During the whole period that the Act was in force 45 animals were destroyed.

20. *Statistics.*—The following returns were published in connection with local enquiries under provincial direction:—

(1) Report on the operations of the establishments for stamping weights and measures submitted to Government, Revenue Department, in July.

(2) Comparative statements of irrigation and rainfall forwarded to the Chief Engineer for Irrigation in October.

(3) Statement of quantity and value of crops irrigated under major productive works and minor works for which capital and revenue accounts are kept.

(4) Season reports in three sections (rainfall, cultivation and prices of food-grains and salt)—monthly.

(5) Quarterly and annual reports of cattle mortality.

21. *The Madras Agri-Horticultural Society.*—The report of this society for 1901–1902 has not yet been received.

VI.—AGRICULTURAL EDUCATION.

22. The recommendations submitted to Government in regard to primary education in agriculture continued under the consideration of Government.

As stated in the previous year's report, the question of giving some instruction in agriculture to minors under the Court of Wards was under consideration. An instructor on Agriculture and Botany to the minors at Newington has been sanctioned and arrangements have also been made for the practical instruction of the wards in morning classes at the College of Agriculture, Saidapet.

23. *Higher Education.*—The College of Agriculture is administered by the Educational department, but the report is forwarded to the Director of this department for perusal. The number of students in the College fell from 42 to 38. No changes were made during the year in the College course, but as stated last year, the question of improving it has been investigated and reported upon by a Special Committee and the orders of Government are awaited on the proposals. Dr. Leather, the Agricultural Chemist to the Government of India, did duty at the College for less than a month (4th to 31st March) against the sanctioned period of six weeks. He delivered 18 lectures to class III and devoted 11 hours to Laboratory Demonstrations (3 hours with class III and 8 hours with class II). The insufficiency of the short period of lectures now given and the necessity for providing a Chemist for the Agricultural department has been accepted by Government who have addressed the Government of India on the appointment of a Special officer for teaching and investigation in the Presidency. As the post of the Superintendent, Civil Veterinary Department, was vacant from September to March, the usual course of lectures on Veterinary matters was not delivered in the College of Agriculture.

The Veterinary Hospital suffered during the first half of the year on account of the competition of the S.P.C. A's infirmary but regained its position subsequently. The total number of cases treated has steadily increased from 804 in 1899–1900 to 856 in 1900–1901 and 867 in 1901–1902.

Owing to a favourable season the students enjoyed more opportunities of engaging in practical work on the farm than they did during the previous year.

VII.—THE PUBLICATION OF AGRICULTURAL INFORMATION.

24. During the year under report, the following bulletins were published by the department:—

(1) No. 45 "A Tea-eel worm Disease in South India" by C. A. Barber, Esq., Government Botanist.

(2) No. 46 "The Sugarcanes of Madras" by C. Benson, Esq., M.R.A.C., Deputy Director of Land Records and Agriculture.

25. The subject chosen for the Industrial Monograph for the year under report is "Wood carving" and Mr. Thurston, Superintendent, Government Central Museum, has undertaken to prepare it. It was however not due before the end of the year.

26. The number of papers received from and communicated to other Provincial departments was as follows:—

Subject.	Received.												Sent.			
	Reports.		Books.		Pamphlets.		Journals.		Other papers.		Total.					
	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Indian.	Foreign.	Reports.	Pamphlet.	Other papers.	Total.
Agriculture	12	26	1	4	23	204	45	168	17	6	98	408	..	3	..	3
Statistics .. Crop ..	..	..	3	..	..	..	..	..	..	..	3	..	..	..	17	17
Statistics .. Trade ..	..	..	1	..	..	..	2	4	..	..	3	4	2	..	..	2
Forest	12	..	..	..	2	..	12	..	1	..	27	..	..	..	..	..
Arts and Industries ..	..	..	..	..	7	..	43	..	..	..	50	..	..	..	..	..
Botany	2	..	1	2	..	..	..	3	..	..	3	5	..	..	..	..
Entomology	1	..	..	1	..	..	..	..	..	..	1	1	..	..	..	..
Geology and Minerals.	7	..	..	..	1	..	..	..	..	..	8	..	..	..	..	..
Meteorology	15	..	1	..	..	..	..	..	..	..	16	..	..	..	..	..
Live stock	..	..	..	..	..	..	50	..	..	..	50	..	..	..	..	..
Veterinary science ..	11	..	..	..	..	..	..	..	..	..	11	..	..	..	..	..
Total ..	60	26	7	7	33	204	152	175	18	6	270	418	2	3	17	22

APPENDIX.

Annual Report of the Government Botanist, Madras.

I have the honour to forward the following annual report on the work done by my department. The period included is from 1st April 1901 to 31st March 1902.

2. The following were my movements during the year:—

The month of April was spent at Head Office. A careful study of the plague of cockchafers was made at Ootacamund and a long report prepared on the Gódávari sugar-canes.

On 8th May I left head office on a three months' tour in Tinnevelly. Collections of grasses were made at different parts of the district and special attention throughout the tour was devoted to forest trees in the mixed and evergreen forests. A short visit was paid to the sub-alpine region around Kalivayalpil and a large number of interesting plants were obtained in an ascent of Agastiar Malai (6,000 feet).

I reached Ootacamund after a short visit to Madras and remained there from 1st August to 2nd October. As some of the specimens were found to be mouldy, the whole collection was thoroughly overhauled. A certain amount of herbarium work was done during the monsoon, special attention being devoted to forest trees.

At the request of the Forest Department, the next tour, 2nd October to 17th November, was spent in the Anamalai forests. Here the evergreen forests were again carefully collected over. The weather was exceptionally bad and most of the trees had neither flowers nor fruits upon them. A trip to the Grass Hills (7,000–8,000 feet) produced some interesting mountain plants.

From 17th November to 23rd January I remained at Head Office. A preliminary study was made of the Anamalai forest trees and a good deal of attention was devoted to experiments with white grubs and to preparations for the Gódávari sugar-cane station.

The remainder of the year was spent in the Gódávari district. A considerable time was devoted to the sugar-cane station, but the canals were toured over and a special study was made of the date palms of the neighbourhood.

3. It will be seen that there were two main collecting tours, both primarily in the evergreen forests, although other tracts were also traversed.

The high forest was studied at Kannikatti in the Tinnevelly Hills and at Paralai in the Anamalais.

Deciduous or mixed forest at Mundanthorai, Kannikatti, Courtallam and below Poonachi.

The sub-apline flora was collected at Poonachi (5,000 feet), Kalivayalpil (4,000 feet), Agastiar Malai (6,000 feet), and the Grass Hills above Paralai (7,000–8000 feet).

Considerable attention was paid throughout the year to grasses, and special collections were made at Palamcottah, Ambásamudram, Mundanthorai, Courtallam, Aulankolam, Pollachi, Poonachi, Ootacamund, Dwarapudi and Mandapeta, in order to determine their relative distribution.

It is too early to speak of the value of the collections made. Several undoubtedly new species have been found, and many valuable additions have been made to our collections of forest trees and grasses.

4. Progress in the herbarium has been considerably greater during the year. The work was hampered by a somewhat serious accident which kept the plant collector in hospital for some months, but the addition of a second assistant to the staff has made itself very distinctly felt. A larger number of plants were collected than in any previous year. This will be seen from the accompanying figures of plants collected during the last three years.

From January 1899 to March 1900 (tours in Madras, Tinnevelly, South Arcot and Ganjám) collection Nos. 1-1,500.

From 1st April 1900 to 31st March 1901 (tours in Vizagapatam and South Canara) collection Nos. 1,501–2,700.

From 1st April 1901 to 31st March 1902 (tours in Tinnevelly and the Anamalais) collection Nos. 2,701—4,300.

Over 4,000 sheets of specimens have been poisoned and mounted. The heavy arrears in the herbarium are being taken in hand and the constant attention of one assistant is devoted to the collections.

5. Several additions have been made to the herbarium from outside sources. A fine set of Assam ferns has been obtained by purchase, a set of grasses has been received from the Director of the Botanic Department, Sydney, New South Wales, and a certain number of ebonies and

grewias from Ceylon. Sets of specimens were sent to the United States of America Agrostologist and the Botanic Departments in New South Wales, Ceylon and Calcutta. A few specimens were sent to the Madras Museum for the Index collection and a number of spirit and dried plants obtained for Dr. Bourne for class work in the Presidency College.

6. A good deal more work of an economic character has been done during the year than in any previous one. Nevertheless many matters have had to be left untouched and scant attention has been given to others.

The subject which has received most attention has been sugar-cane cultivation. A parcel of canes from Udamalpet was found to be infested with moth-borer, Chilo simplex. Traces of fungi were also found, but only in the hyphal condition, and therefore not determinable. The moth-borer, which causes the appearance known as "dead-heart" in the young canes, is known wherever the sugar-cane is grown. It usually is most abundant when the plants have had unseasonable weather in the early stages of growth. A short correspondence was carried on concerning the recent introduction into Vizianagram of a number of kinds of Mauritius canes. Special attention was again devoted to the canes in the Gódávari district. A long report was prepared at the beginning of the year on the introduction of Hospet canes, and the months of January to March were devoted to the founding of an experimental sugar-cane station at Samalkot.

7. During the long halts at Samalkot a careful study was made of the mode of tapping and general life of the date palms of the district. It was noted that the mode of cutting the trees for toddy was very different from that practised in Vizagapatam, also that the number of deaths from overtapping was very much larger. It was not difficult also to find the palm weevil, Rhynchophorus ferrugineus, in the trees.

As it was not found possible to arrive at certain conclusions from casual visits to a number of different plantations, a definite area was submitted to an exhaustive analysis. Half a mile of date trees were counted and all the dead ones carefully examined. Two facts were at once evident. Firstly, all the trees had died shortly after tapping, for they always showed the slanting cut at the top, and secondly, the great majority of them had no trace of borer or other such injury, so that the conclusion was forced upon one that the chief cause of death was overtapping. A report on the subject was forwarded to the Board of Revenue.

8. The "white grub" of the Nilgiris received a good deal of attention during the year. These, it will be remembered, were held to be responsible for the failure of sowings of Seoni wheat which it was sought to introduce, and the Government Botanist was directed to make a study of them.

The "white grub" is the larval form of the cockchafer beetle. As it was discovered that the chief flights of the latter occurred during the April–May rains, collections were made with a view to identifying the species which were causing the damage. Specimens sent to Cambridge for determination proved them to be new or rare species, and a series of experiments were instituted in order to learn something of their life-history.

As is well known, the study of the life-history of cockchafers is one of great difficulty and takes years to accomplish. Pits were dug at various periods to find out the condition of the pests and the different species were sown in order to find out which grubs belonged to the different beetles. These observations are not yet completed. A number of facts have, however, been brought to light which indicate the way in which the pest can be combated.

9. A disease in the Wynaad pepper plantations received a certain amount of attention. After a careful examination of the specimens received it was decided that study at a distance was useless. Several pests were found, and it is always a matter of difficulty to determine which of these has attacked plants weakened from some other cause and which has made an onslaught on originally healthy plants.

10. In conclusion of this review of the economic work during the year, I will mention some of the many other subjects of minor importance which have engaged our attention.

The following were dealt with:—Rust in wheat from the Palnis; minute insects (Aptera) among Cinchona seedlings, determined to be harmless because of the character of their mouthparts; smutted Sorghum, remedies suggested and a scheme of experiments with recent methods drawn up for the Saidapet farm; turnip fleas (Bagrada picta) in the Ootacamund gardens; plant bugs (Nezara viridula var.) in the gardens and notably in the Cinchona plantations; difference in colour of coffee beans; a destructive outbreak of green scale (Aspidiotus Camelliae) in the Kanan Devan Tea plantations; a coffee-root fungus in Coorg; a disease of the prickly-pear, unfortunately received in bad condition; Striga euphrasioides, etc., as pests in badly cultivated lands; sand-binding plants as protection on the East Coast; salt bushes as fodder plants; the requirements of the Durian tree as regards climate and elevation; fibre machines suitable for "Aloe fibre"; and questions on Hydnocarpus, mosquitoes, Balsamodendron Berryi as a hedge plant, various species of Cassia as "senna," Tephrosia or "wild indigo" for green dressing, and many other references of minor importance.

11. A number of photographs have been taken of subjects of economic interest and a set of negatives has been sent to Dr. Watt for copying.

A considerable number of forest trees and shrubs have been named for forest officers.

A labelled collection of barks of Anamalai trees was made. These are to be handed over to the Conservator of Forests, Southern Circle, for his Museum at Coimbatore.

As already stated, a large collection of grasses has been made during the year. A set of 46 species was obtained in the neighbourhood of Ootacamund for the Supply and Transport Officer, Southern Circle, Wellington, and a preliminary list of South Indian grasses was prepared at the request of the Forest Department.

Considerable additions have been made to the collection of pests and diseases during the year, but efforts in this direction have been discouraged because the staff is fully occupied with other matters.

A commencement has been made towards the formation of a herbarium of plants grown as crops. This will form an important part of our future work. Such plants as sugar-cane cannot be preserved in this way, but a series of photographs to scale and analytical drawings have been made. For this kind of work, however, an artist will be needed and descriptions of varieties will be incomplete without a simple chemical analysis.

Resolution—Mis. No. 5155, dated 1st September 1902.

The Board begs to submit herewith its report on the administration of the Department of Land Records and Agriculture during 1901–1902, and to state that the orders issued in G.O., No. 709, dated 8th August 1902, were received too late to allow of the points referred to in paragraphs 2 to 6 being included in the report of the Settlement Department.

(True Extract.)

(Signed) C. BENSON,
for Secretary.

To the Secretary to Government, Revenue Department,
with report on the operations of the Department
of Land Records and Agriculture for 1901–1902.

Order—No. 942, Revenue, dated 20th October 1902.

Miscellaneous.

The report has been prepared in the form hitherto adopted. For the future, the subject of land records and their utilization will be dealt with together with that of revenue settlement and the present report will deal with agricultural work in all its aspects with separate sections on the work of the Civil Veterinary department and of the Government Botanist.

2. *Land Records.*—The work done by the district survey establishments seems extraordinarily uneven in the several districts and generally unsatisfactory. The general lines of a scheme for providing adequate supervision over the preparation and maintenance of the survey and other village records have, however, been settled: and the formulation of detailed proposals for the sanction of the Secretary of State has been entrusted to Mr. R. C. C. Carr, I.C.S., who has been placed on special duty for the purpose.

3. *Agriculture.*—The activities of the department were chiefly engaged on the two experimental farms at Bellary and Koilpatti and on the experimental sugar station at Samalkota. Some progress was made in getting these farms into working order.

The departmental experiment in planting out *agave* plants appears so far to have been fairly successful. The reports on the further trials with *ground-nut* seed are awaited: but it is feared that these trials, being made under the supervision of busy revenue officials, are hardly likely to afford results of any certainty or value.

4. *Veterinary Science.*—The annual report of the Civil Veterinary Department has been elsewhere noticed. The Government will, however, take this opportunity of reminding the Board and the Superintendent that the proposals called for on the subjects of opening veterinary classes and of establishing veterinary dispensaries are long overdue.

5. *Agricultural Education.*—A revised curriculum has been prescribed for the Agricultural College at Saidapet: and steps have been taken to procure for the department the services of a whole-time agricultural chemist whose duties will comprise lecturing at the college as well as conducting investigations in the field.

(True Extract.)

(Signed) M. HAMMICK,
Ag. Secretary to Government.

To the Board of Revenue (Revenue Settlement).
„ the Educational Department.
„ the Superintendent, Madras Survey.
„ the Inspector-General of Agriculture (three copies).

Forwarded to the Board of Revenue (Revenue Settlement).

(By Order.)

(Signed) C. RATNAVELU MUDALIYAR,
Registrar.

Endorsement No. 942A.

Copy to the Government of India, Revenue and Agricultural Department.

(Signed) N. E. MARJORIBANKS,
Under Secretary to Government.

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